Before the

Federal Communications Commission

Washington, D.C. 20554

In the Matter of	)	
	)	
	)	GN Docket No. 17-108
Restoring Internet Freedom	)	
	)	
	)	

Comments of AARP

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Summary and Overview of Comments

Open broadband Internet networks are vital to older Americans

For older Americans, i.e., those in age 50 and older households, the benefits of broadband are substantial and growing. The widespread availability of high quality and affordable broadband connections—both fixed and mobile—will enable new applications and services that can enhance older Americans' quality of life, including new methods of delivering healthcare and support for independent living. Home broadband is now utilized by those in the 50-64 age group at a rate that is nearly identical to that of younger demographics. Figure 1 shows 2017 data from the Pew Research Center.

In addition to applications with wide appeal, such as access to over-the-top video, the ability of

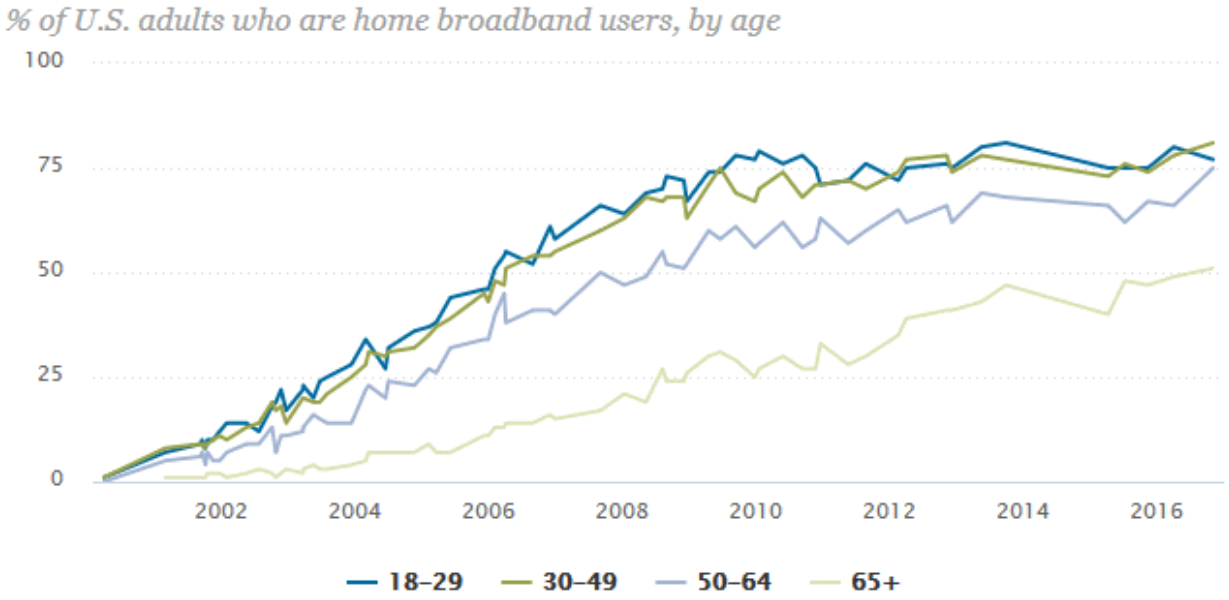

Figure 1: Percent of Households by Age Group with Broadband

broadband to enable distance learning, telehealth, and aging-in-place applications will further motivate older Americans to utilize broadband, and to demand affordable and high-quality broadband connections.[1] As the current 50-64 demographic ages, the future "65 and older age" group will likely merge with the other age groups as well.

[1] "Seniors also place a high value on the importance of home broadband service, according to a survey conducted by the Center in 2017. The vast majority of adults ages 65 and older say they believe having access to high-speed internet at home is either essential (42%) or important (49%). This puts older Americans on par with Americans of other ages when it comes to the importance of home broadband service." "Tech Adoption Climbs Among Older Adults," Pew Research Center, May 17, 2017. http://www.pewinternet.org/2017/05/17/tech-adoption-climbs-among-older-adults/

Policies to promote a vibrant and competitive Internet ecosystem are essential for the continuation of this success. Absent open Internet policies that manage market power in last-mile broadband networks, the growth of broadband benefits will be limited, and undue power will be handed to broadband gatekeepers who could disadvantage end users, as well as suppliers of Internet content and services. If there were robust competition in broadband markets, consumers could choose from among many broadband ISPs. If consumers could easily "fire" their ISP, market forces might offer consumers protection from the actions of any one broadband provider. Unfortunately, broadband markets are not competitive. Thus, unless robust open Internet rules are maintained, Internet technology will be shaped for the narrow gain of broadband providers.

The Commission should not go "back to a Title I future"

Based on a thorough review of the *2017 NPRM*,[2] and careful consideration of the questions raised therein, AARP believes that its proposal to revert to a Title I framework will have negative consequences for AARP's members, and for all consumers. The *2017 NPRM's* proposals will also harm competition, innovation, and investment. The implications of the Title I reclassification proposed by the *2017 NPRM* also extend to freedom of expression. AARP believes strongly in the principles of collective purpose, collective voice and the collective power of the age 50 and over population to change the market based on their needs. These principles guide our efforts. AARP, an organization with over 38 million members, relies on the Internet to communicate with its members and other older Americans, and to provide them the information they need to make decisions on issues that are vital to those who are age 50 and older. Up to this point the content that AARP distributes using the Internet, which many older Americans ultimately access using broadband connections, is treated on a non-discriminatory basis, thus promoting AARP's ability to educate and inform the collective interests of the population of people age 50 and older and their families. However, the proposals contained in the *2017 NPRM*, including reclassifying broadband Internet access services under Title I, have the potential to hinder AARP's ability to pursue the principles of AARP's mission. The proposed changes are of great concern to AARP and all older Americans. It is clear to AARP that the stakes of this proceeding could not be higher.

As suggested by the *2017 NPRM,* AARP has considered paths other than Title II to achieve the pro-consumer and pro-competition objectives associated with neutral broadband Internet access, and AARP will discuss those options in detail in these comments. Based on its evaluation of the history of the Commission's experience under Title I, and on the assessment of other approaches suggested in the *2017 NPRM,* AARP has reached the conclusion that Title II still provides the best path forward to ensure Internet freedom. Going "back to a Title I future" will undermine key protections provided by the *2015 Title Order,* and harm innovation, investment, and the

[2] *In the Matter of Restoring Internet Freedom*, WC Docket No. 17-108, Notice of Proposed Rulemaking, May 23, 2017. Hereinafter, *2017 NPRM*.

tremendous contribution that Internet technology has delivered to the U.S. economy. The "light-touch" framework established with the *2015 Title II Order*, which applied substantial forbearance, contains reasonable "rules of the road" that are consistent with investment and innovation. Based on a thorough evaluation of the issue, AARP does not believe that a broadband future which includes open Internet protection can be achieved through Title I.

The Commission will not be able to support a no-blocking rule without Title II

The *2017 NPRM* proposes a Title I future for broadband Internet access services.[3] The *2017 NPRM* also supports the continuation of no-blocking rules that are essential to protect Internet freedom.[4] But, due to a long history of setbacks at the D.C. Circuit, that Title I is not sufficient to support no-blocking rules.

The *2017 NPRM* seeks comment on other sources of legal authority to "adopt rules" if it classifies broadband Internet access service as a Title I information service. Given that the Commission has previously failed to support no-blocking rules under theories that combined Title I with either ancillary authority,[5] or Section 706,[6] AARP does not believe that revisiting these paths is a reasonable option. Other avenues are no more promising, for example:

- The Commission might attempt to resurrect the discrimination and "fast lane" approach of the *2014 Open Internet NPRM*.[7] That approach, however, would fail precisely due to the need for minimum performance requirements associated with non-fast-lane services. A minimum level of access is needed to prevent broadband ISPs from artificially degrading the non-fast-lane services, and to ensure an "Internet experience that is sufficiently robust, fast, and effectively usable."[8] A "fast lane" scheme is destined to fail under Title I. Judge Silberman's dissent in the *Verizon v. FCC* case illustrates why:

  > "while there is a possibility that a 'fast lane' Internet service might be offered on a non-common carriage basis, the service that most users receive under this rule would still have to be offered as common carriage, at a regulated price of zero."[9]

- Alternatively, the *2017 NPRM* suggests that Section 230 might be considered as a source of authority. However, it is doubtful whether the hortatory language of Section 230(b) is sufficient. The provisions of that section are overly narrow. For example, the Section

[3] *2017 NPRM,* ¶44.
[4] *2017 NPRM,* ¶80. "We emphasize that we oppose blocking lawful material. The Commission has repeatedly found the need for a no-blocking rule on principle, asserting that 'the freedom to send and receive lawful content and to use and provide applications and services without fear of blocking is essential to the Internet's openness.'"
[5] *Comcast v. FCC*, 600 F. 3d 642 (2010).
[6] *Verizon v. FCC*, 740 F.3d 623 (2014).
[7] *In the Matter of Protecting and Promoting the Open Internet*, GN Docket No. 14-28, Notice of Proposed Rulemaking, May 15, 2014, ¶97.
[8] *2014 Open Internet NPRM*, ¶¶98-99.
[9] *Verizon v. FCC*, Silberman dissent.

230(b)(3) contains language regarding "user control" which only applies to "information received" by users. Nothing in Section 230(b)(3) can be construed as governing the behavior of broadband ISPs vis-à-vis edge providers. Broadband ISPs could discriminate against edge providers, and Section 230(b)(3) would provide no avenue for relief. Section 230(b)(3) is too narrow to support the "virtuous circle." In addition, even for end users, Section 230(b)(3) does not enable protection of information that they *send*, nor does it enable protection for end-user's usage of applications and services. Section 230(b) will not provide a sufficient foundation to protect consumers and edge providers from blocking and discrimination, or to support the virtuous circle, which is critical to continuing innovation and investment.[10]

The *2015 Title II Order* provides a reasonable "light touch"

While the *2017 NPRM* is highly critical of the *2015 Open Internet Order*, asserting that the order resulted in "utility-style" regulation of the "Internet,"[11] the regulatory framework created by the *2015 Title II Order* exercised substantial forbearance and did not impose anything close to public-utility obligations on broadband ISPs. Through its forbearance action, the Commission left certain core authorities in place,[12] and refrained from imposing "public-utility" regulations, such as those associated with the control of profits or rates, or requiring tariffing, network unbundling, or universal service support.[13] The result was "enough Title II" to satisfy the D.C. Circuit that a foundation for the open Internet rules had been established.[14] With Title II, the Commission finally gained the ability to prevent actions on the part of broadband ISPs that could harm consumers, undermine competition, and discourage investment. Walking away from Title II will strip the Commission of its ability to support the no-blocking foundation that the *2017 NPRM* still insists is a vital element of the protection of competition, innovation, and investment.[15]

There is no evidence that investment has been harmed by the *2015 Title II Order*

The *2017 NPRM* asserts that broadband investment has been harmed as a result of the *2015 Title II Order*.[16] Assessing the impact of the *2015 Title II Order* on broadband ISP investment requires data on all factors that can influence broadband ISP investment, and given the short timeframe since the 2015 adoption of Title II, a sufficient data set is not available to support any reasonable statistical analysis. Historically, however, USTelecom data show that for U.S. wireline broadband providers (i.e., telephone companies), the years 1996-2005, when these

[10] *United States Telecom Association, et al., v. F.C.C.* 825 F.3d 674 694 (2016).
[11] *2017 NPRM,* ¶3.
[12] *2015 Title II Order,* ¶456.
[13] *2015 Title II Order*, ¶37.
[14] 825 F. 3d, 674 726-732.
[15] *2017 NPRM*, ¶80.
[16] *2017 NPRM,* ¶¶4, 45-46.

companies were regulated under Title II, were associated with some of the highest levels of capital expenditures ever observed.[17]

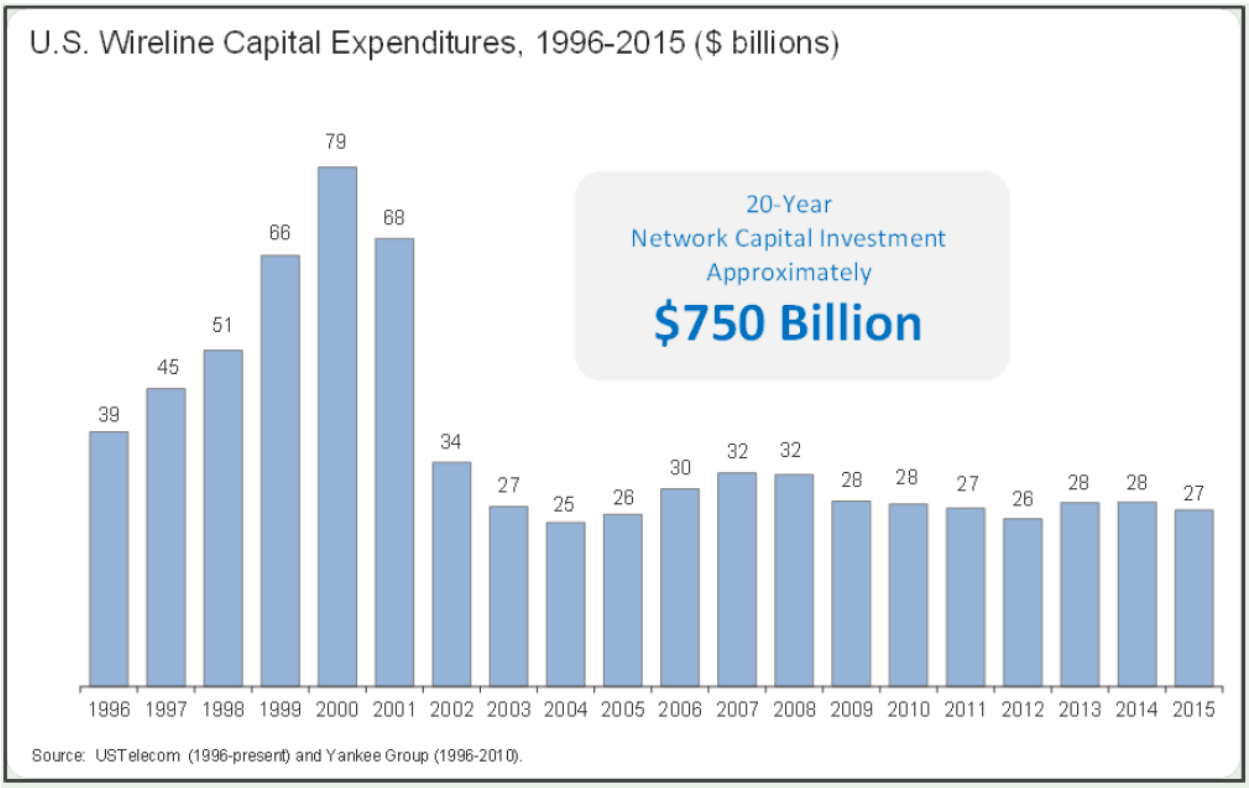

Figure 2: USTelecom data on U.S. Telephone company capital investment--1996-2015

Data in Figure 2 show that capital expenditures of $434 billion were associated with the nine years 1996-2004, years when telephone company broadband was classified as Title II telecommunications services. For the Title I years (i.e., the ten years 2006-2015), wireline capital expenditures were $286 billion.[18] The reclassification of wireline broadband as a Title I service in 2005 did not result in wireline investment reaching the peaks that it achieved in the early 2000s.[19] Similarly, as noted in the *2015 Open Internet Order,* "between 1993 and 2009 (while voice was the primary driver of mobile revenues), the mobile industry invested more than $271 billion in building out networks…"[20] The USTelecom data casts doubt on the *2017 NPRM's* narrative that Title II is incompatible with broadband investment.

[17] Patrick Brogan, "Broadband Investment Ticked Down in 2015," Research Brief, December 14, 2016, p. 3. https://www.ustelecom.org/sites/default/files/Broadband%20Investment%20Down%20in%202015.pdf
[18] This analysis treats 2005 as a watershed year, leaving it out of either period. Adding 2005's $26 billion in capital expenditures to either period does not change the outcome by much—in either case, there was substantially more investment in the Title II period.
[19] Patrick Brogan, "Broadband Investment Ticked Down in 2015," Research Brief, December 14, 2016, p. 3. https://www.ustelecom.org/sites/default/files/Broadband%20Investment%20Down%20in%202015.pdf
[20] *2015 Title II Order*, ¶39.

The investment studies cited in the *2017 NPRM* are fatally flawed

The *2017 NPRM* relies on three studies to support the claim that the 2015 Title II classification led to declining broadband ISP investment: A blog post by Hal Singer; a white paper by George Ford; and a policy brief released by USTelecom. These studies are deeply flawed.

- The Singer blog post, the most frequently cited study in the *2017 NPRM*, only looks at raw data on broadband ISP investment, and bases its conclusions on one-full year of Title II experience. Even if one ignores the unrealistically short data series, the Singer approach is faulty as it assumes that the *only factor* that influences broadband ISP investment decisions is regulation. The *post hoc fallacy* could not be illustrated more clearly—Singer purports to show that broadband ISP investment drops, and concludes that the only thing that could have caused this is Title II reclassification. Singer ignores all other factors that can influence broadband ISP investment, such as technological change, adoption of new network management strategies, competition, or the timing of large investment projects. The Singer blog post is not a credible source on broadband ISP investment.

- The Ford paper also contains fundamental errors that render it unusable as a source regarding the impact of the *2015 Title II Order* on investment. Foremost, the Ford paper does not even study the impact of the *2015 Title II Order*. Rather, the Ford paper studies the alleged impact of the "threat" of Title II on investment during the years 2011-2015, and concludes that the "threat" of Title II reduced investment, as compared to the investment trend that would have been expected given observed investment trends in a control group. There are significant problems with Ford's methodology. The Ford study does not focus on broadband investment. Instead, the Ford paper studies investment in the much more broad "Broadcast and Telecommunications" industry classification. The Ford paper also utilizes a questionable proxy group of industries to support its "counterfactual" analysis. Another glaring error is that the Ford paper ignores the fact that telephone companies were governed under Title II during most of the paper's "pre-treatment" period (i.e., during the years 1980-2005). Because the pre-treatment period had Title II regulation in place, the investment trend observed during the years 1980-2005 reflects the full impact of Title II, not the impact of Title I that the paper claims. Like the Singer blog post, the Commission can draw no conclusions from the Ford paper.

- The USTelecom research brief asserts that should Title II classification continue, broadband investment in the U.S. will decline to levels observed in the European Union. But the USTelecom research brief also admits that many factors may be influencing the investment "gap" it perceives, including "geography, density, competition, regional economics, and the regulatory environment." Thus, the projected impact on broadband investment in the U.S. depicted in the USTelecom research brief comes with many "ifs."

If geography in the U.S. and the EU were the same, *if* population density were the same, *if* competition were the same, *if* regional economics were the same, and *if* the regulatory environment were the same, then investment *might be* lower. This is certainly not a "slam dunk" regarding the potential impact of the *2015 Title II Order* on investment. Furthermore, the USTelecom research brief also inappropriately equates the *2015 Title II Order's* "light touch" approach to imposing open Internet rules with the entire, and much more vigorous, regulatory environment in the European Union. The EU applies unbundling and rate regulation. The *2015 Title II Order* exercised forbearance for those requirements, as well as numerous others.

In summary, there is no evidence that investment has been harmed, and strong indications that broadband ISPs have pursued a "business as usual" approach to investment since the *2015 Title II Order* went into effect. Comcast's August 2015 announcement that it will upgrade its entire service area to DOCSIS 3.1, which enables gigabit speeds,[21] and Verizon's April 2017 announcements[22] of a massive fiber upgrade to its networks in anticipation of 5G are good illustrations.

Other issues discussed in these comments

Blocking, throttling, and no-paid prioritization rules are needed

- The *2017 NPRM* questions whether the elimination of the no-blocking rule would result in continued compliance on the part of broadband ISPs, noting that prior to 2015, some ISPs voluntarily complied with the no-blocking principle. AARP does not believe that a "trust me" approach is sufficient as broadband ISPs have economic incentives to discriminate, and these incentives are likely to increase, given the growing set of edge services that they provide. Stripping the Commission of its established authority to prevent blocking would send a signal that there is no longer a "cop on the beat," which could make misbehavior more likely.

- The *2017 NPRM* raises the question of "when is 'throttling' harmful to consumers?" AARP believes that this behavior is *always* harmful to consumers. Regarding throttling, the negative impact of throttling on consumers can arise with even subtle interference

[21] "Comcast planning gigabit cable for entire US territory in 2-3 years, *ARS Technica*, August 24, 2015. https://arstechnica.com/business/2015/08/comcast-planning-gigabit-cable-for-entire-us-territory-in-2-3-years/ See: also: "Comcast has just started rolling out its gigabit internet service," *The Verge*, Dec 26, 2015, https://www.theverge.com/2015/12/26/10667998/comcast-begins-gigabit-internet-service . See also: "Comcast's gigabit cable will be in 15 cities by early 2017: San Francisco, Seattle, Denver, and others to get gigabit upgrade next year," *ARS Technica*, November 2, 2016. https://arstechnica.com/information-technology/2016/11/comcasts-gigabit-cable-will-be-in-15-cities-by-early-2017/

[22] See, "Verizon buying 37 million miles of fiber to boost its wireless network, Verizon buys fiber from Corning, with a focus on wireless Internet—not FiOS." *ARS Technica*, April 18, 2017, https://arstechnica.com/information-technology/2017/04/verizon-spends-1b-on-fiber-but-its-for-5g-wireless-not-more-fios/ . See also, "Verizon signs $300M optical cable purchase with Prysmian," *Fierce Telecom*, May 8, 2017. http://www.fiercetelecom.com/telecom/verizon-signs-300m-optical-component-purchase-prysmian

with the user's experience, resulting in significant harm. For example, research conducted by Google has found that consumers' decisions to stay on a web page can be made in *milliseconds*. Even minor interference can disadvantage consumers and edge providers

- The need for a bright-line rule addressing throttling is even more urgent given the growing variety of services into which broadband ISPs are expanding. Broadband providers are currently taking positions in key industries that may result in their gaining competitive advantage in areas such as home automation, smart grid, "Internet of Things," and medical monitoring. Absent policies that manage ongoing market power in last-mile broadband networks, the growth of these technologies, and related network effects that can arise from broadband, will be limited.

- The *2017 NPRM* also raises questions as to whether the no-paid-prioritization rule is still necessary. AARP believes that this rule is still essential to ensure the continued benefits of an open Internet. Paid prioritization will generate significant problems that can only be solved by more regulation. Paid prioritization opens the door for discrimination, and would place the Commission in the position of needing to ensure that undue discrimination does not occur, which certainly requires Title II authority. Other problems associated with the introduction of paid prioritization include:
    - Pay-for-priority and fast lanes will cause customer confusion and will degrade the value of broadband connections.
    - Paid prioritization will harm edge providers. Each broadband provider holds bottleneck on access to the edge provider's potential users, viewers, or customers. Thus, the edge provider would have to negotiate with a large number of broadband providers to reach fast-lane agreements to cover all broadband mass-market customers. This increase in transaction costs will reduce edge provider profits and discourage innovation and investment.
    - Fast lanes could fragment Internet applications, content, and services. If a startup edge provider found the prospect of negotiating with all broadband ISPs for fast-lane services too cumbersome, the startup might not be able to deliver the service to all broadband subscribers, leaving some end users without the ability to access the startup's services, or to use them at their full potential.

The Internet conduct standard and transparency rules are needed

- The *2017 NPRM* proposes to eliminate the Internet conduct standard, with no alternative replacement. AARP is opposed to this approach, and finds it to be inconsistent with the *2017 NPRM's* stated opposition to the blocking of lawful content. The Internet conduct standard provides a backstop to address non-specific ISP behavior that may threaten both end users' and edge providers' ability to utilize broadband Internet access facilities without undue interference. The *2017 NPRM* indicates that the case-by-case approach

associated with the Internet conduct standard poses a threat to innovation, however, the *2017 NPRM's* consideration of innovation only extends to broadband ISPs, and does not consider the potential impact of ISP mischief on edge provider innovation.

- The *2017 NPRM* questions whether the additional "transparency" requirements associated with the *2015 Title II Order* remain necessary "in today's competitive broadband marketplace."[23] AARP believes that these rules continue to provide vital consumer protection. There is no evidence to support the proposition that broadband markets are competitive for either end users or edge providers. Absent competition, the transparency rules are needed to ensure that broadband providers do not disadvantage consumers and edge providers, degrade interoperability, or stifle innovation.

Mobile broadband services are not "private mobile"

- The *2017 NPRM's* proposal to reclassify mobile broadband services as "private mobile services" is inconsistent with the design of mobile broadband technology and the way that it is sold. Private mobile services, such as private taxi dispatch services, have no relation to today's mobile broadband Internet access services, and the public interest will not be served by this proposed reclassification. Mobile broadband providers offer their consumers the same product as fixed wireline broadband providers—bandwidth. Offers of "unlimited" data transmission indicate that nothing more than transmission capability is desired by consumers. Furthermore, unlike private mobile services, this offer is both directed at, and accepted by, hundreds of millions of subscribers. These facts about mobile broadband services today fulfill the statutory definition of commercial mobile services, i.e., services which are (1) "provided for profit," and (2) make "interconnected services" available, "to the public" or to "a substantial portion of the public."[24] Given the impending integration of mobile and fixed broadband technologies, a "private mobile service" classification would pick the winners associated with the future integration of fixed and mobile broadband networks—that is, the incumbents that own the networks, to the exclusion of edge innovators. If the FCC goes down the "private mobile services" path, it will harm innovation, and the global leadership the U.S. has enjoyed with advanced Internet applications and services will be threatened.

Antitrust is not a reasonable alternative

- The *2017 NPRM* also raises the issue of whether it would be preferable to rely on existing antitrust regulations rather than the *2015 Title II Order's* rules to address "various forms of anticompetitive conduct, such as collusion and vertical restraints." The Commission's *2015 Title II Order* provides an approach that is superior to the antitrust backstop. Antitrust litigation is expensive, and the costs of antitrust litigation for upstart edge

[23] *2017 NPRM*, ¶90.
[24] 47 U.S.C. §332(d)(1).

providers could smother innovation and investment at the network edge. In addition, antitrust actions are notoriously slow moving, with criminal investigations typically taking years to complete. Antitrust applied to individual broadband ISPs could also result in a patchwork quilt of compliance conditions that would harm network effects, innovation, and investment.

The Internet has been transformed since the 2002 Cable Modem Order

- The *2017 NPRM* raises questions regarding whether there have been changes in broadband since the 2002 *Cable Modem Order*. Broadband Internet access has been transformed during the last 15 years—today broadband providers sell *telecommunications* that enables end users to reach edge providers. No longer do consumers need a proprietary software portal to reach the Internet content and services of their choice. Indeed, a review of broadband provider products finds that the predominant service offering is nothing more than *upload and download speed*. Verizon's FiOS advertising message is typical "Unreal Speed: Stream, download, upload, game, share, connect faster than ever before with FiOS Quantum Internet. Do what you want online, right now."
    - Another component of the transition is the fact that today Internet users are also edge providers. By uploading videos, maintaining a Facebook or LinkedIn page, blogging, and gaming, Internet "users" seamlessly slip between the role of consumer of Internet content and services and producer of Internet content and services. Because of the growing production of content by many end users, the proportion of pure "end users" is shrinking, and the number of "edge providers" is growing. This growth has increased the demand for pure transmission capability, a fact recognized by ISPs, who have increasingly promoted the ability to upload as well as download.

- The *2017 NPRM* also questions the *2015 Title II Order's* views on the impact of domain name services (DNS) and caching, and asks how broadband Internet access service would work without DNS or caching.[25] Presumably, the *2017 NPRM* means to ask how broadband Internet access service would function if the DNS or caching service was not provided by the broadband ISP, as both caching and DNS are competitively available. DNS is no longer exclusively provided by broadband providers—consumers regularly utilize third-party DNS services to improve their Internet experience.[26] Similarly,

[25] *2017 NPRM*, ¶37.
[26] See, for example, "4 Reasons Why Using Third-Party DNS Servers Is More Secure," *MUO*, April 17, 2017. http://www.makeuseof.com/tag/reasons-third-party-dns-servers-secure/; see also, "7 reasons to use a third-party DNS service," How-to-Geek, October 22, 2014. http://www.howtogeek.com/167239/7-reasons-to-use-a-third-party-dns-service/ ; see also, "Set Up Third Party DNS for Faster and More Secure Surfing," http://www.practicallynetworked.com/howto/third_party_dns_servers_howto.htm

caching services are available from providers such as Akamai, Limelight, and Level 3.[27] Certainly, the provision of DNS and caching benefits end users, but these services are entirely separable from broadband Internet access services.

- The *2017 NPRM* states, when considering whether broadband Internet access delivers an information service or a telecommunications service, that "there is little reason to think consumers might want a fast or reliable 'transmission . . . of information' but not a fast or reliable 'capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information.'"[28] Certainly, there is reason to think that consumers view these matters separately, and the *2017 NPRM's* attempt to combine them is inappropriate. Consumers demand bandwidth from their broadband ISP to enable access to a variety of applications, based on their own needs and preferences for bandwidth. Consumers' choices of information services, and their quality and performance, are separate choices based on separate preferences. The fact that most consumers have turned to third parties to meet their information service needs emphasizes the separateness.

Broadband ISPs offer telecommunications

- The *2017 NPRM* offers an argument to support the proposition that ISPs do not *offer* "telecommunications" based on the "points" between which information is sent, and on consumer knowledge of sender and receiver locations. The *2017 NPRM's* "points" logic would suggest that local or long-distance voice calling on the legacy PSTN could not be "telecommunications" as consumers do not know the network architecture of the voice network, and thus do not specify each "point" on the network through which the call will pass. The *2017 NPRM's* "points" theory is unreasonable.

- The *2017 NPRM's* view that "Internet service providers do not appear to *offer* 'telecommunications'" was soundly rebutted 12 years ago by Justice Scalia in his dissent in the *Brand X* case:

> Despite the Court's mighty labors to prove otherwise, . . . the telecommunications component of cable-modem service retains such ample independent identity that it must be regarded as being on offer—especially when seen from the perspective of the consumer or the end user, which the Court purports to find determinative. . . . The Commission's ruling began by noting that cable-modem service provides both "high-speed access to the Internet" and other "applications and functions," . .

[27] See for example, https://developer.akamai.com/learn/Caching/Content_Caching.html ; https://www.limelight.com/content-delivery-network/ ; http://www.level3.com/en/products/content-delivery-network/
[28] *2017 NPRM*, ¶36.

. because that is exactly how any reasonable consumer would perceive it: as consisting of two separate things.[29]

The Stevens Report is not controlling

- The *2017 NPRM* cites the 1998 *Stevens Report* as an authority regarding the appropriate classification of broadband Internet access services.[30] As might be expected, the perspective of the *Stevens Report*, written in the pre-broadband year of 1998, does not capture the transformation of Internet access that has occurred since. Broadband technology promoted the development of a robust and full-service network edge, eliminating the need for the portal provided by ISPs in the dial-up world. Furthermore, the *2017 NPRM* is very selective in its reading of the *Stevens Report*, as that report clearly illustrates the separate offer of telecommunications implicit in Internet access services.

The 1996 Telecommunications Act is consistent with broadband as telecommunications

- While the *2017 NPRM* seeks clarification from the 1996 Telecommunications Act on the classification matter, finding clarity in the 1996 Act is a daunting task. As was noted by the late Supreme Court Justice Anton Scalia, "It would be gross understatement to say that the 1996 Act is not a model of clarity. It is in many important respects a model of ambiguity or indeed even self-contradiction."[31] However, it is clear that portions of the 1996 Act are consistent with the idea that broadband is telecommunications. One need look no further than Section 706 of the 1996 Act, with its language regarding the nature of "advanced telecommunications capability" to see that the 1996 Act links broadband and telecommunications:
    - "The term 'advanced telecommunications capability' is defined, without regard to any transmission media or technology, as high-speed, switched, *broadband telecommunications capability that enables users to originate and receive high-quality voice, data, graphics, and video telecommunications using any technology*." (Emphasis added.)

The MFJ anticipated the need for open Internet rules

- The *2017 NPRM* also seeks comment on whether the court associated with the 1982 Modification of Final Judgement (MFJ) thought that Internet access service was a telecommunications service.[32] Internet access services are not mentioned in the consent

[29] *National Cable & Telecommunications Assn. v. Brand X Internet Services* (04-277) 545 U.S. 967 (2005) 345 F.3d 1120, reversed and remanded. Dissent of Justice Scalia. Italic emphasis in original, underline emphasis added.
[30] *2017 NPRM*, ¶29.
[31] 525 U.S. 366 (1999) *AT&T Corp. et al. v. Iowa Utilities Board et al.* No. 97-826. United States Supreme Court. January 25, 1999. 397.
[32] *2017 NPRM*, ¶41.

decree document, or in the District Court ruling.[33] This omission is not surprising, as mass-market commercial Internet access services did not emerge until the mid-1990s. However, the MFJ Court did address information services, and it was clear by the terms of the MFJ that those *could not* be provided by the newly-formed Regional Bell Operating Companies (RBOCs), precisely because of their control of the telecommunications network that was needed to reach information service providers. The MFJ Court describes discrimination problems that are as cogent today for broadband ISPs as they were 35 years ago for the RBOCs:

> All information services are provided directly via the telecommunications network. *The Operating Companies would therefore have the same incentives and the same ability to discriminate against competing information service providers that they would have with respect to competing interexchange carriers. Here, too, the Operating Companies could discriminate by providing more favorable access to the local network for their own information services than to the information services provided by competitors. . .*[34]

The *2015 Title II Order* provides a reasonable framework

For the reasons discussed in these comments, AARP strongly urges the Commission to maintain the classification of broadband Internet access services under Title II, and to maintain the regulatory framework contained in the *2015 Title II Order*. Returning to Title I all but assures that the Commission will not be able to support "Internet freedoms." Instead of protecting Internet freedoms, Title I classification will result in the Commission picking winners in the Internet ecosystem, and those winners will be broadband ISPs. Because of continuing market power in broadband markets, with the overwhelming majority of consumers facing wireline duopolies or monopolies, and edge providers facing terminating monopolies, the abandonment of Title II will result in the Commission tipping the balance in favor of broadband ISPs, who have the potential and incentives to become "gatekeepers" who will disrupt the virtuous circle of investment and innovation. The disruption of investment and innovation will harm economic activity, social communication, and the future of the broadband Internet, the most important telecommunications technology platform that has ever been created.

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[33] Modification of Final Judgement, August 24, 1982, passim; *United States v. American Tel. and Tel. Co.*, 552 F. Supp. 131 (D.D.C. 1983), passim.
[34] *United States v. American Tel. and Tel. Co.*, 552 F. Supp. 131 (D.D.C. 1983), 189, emphasis added.

I. Introduction

AARP respectfully submits these Comments for the FCC's consideration, and thanks the Commission for the opportunity to participate in this important proceeding. The issues raised in the *2017 NPRM* are of profound importance. AARP believes strongly in the principles of collective purpose, collective voice and the collective power of the age 50 and over population to change the market based on their needs. These principles guide our efforts. AARP, an organization with over 38 million members, relies on the Internet to communicate with its members and other older Americans, and to provide them the information they need to make decisions on issues that are vital to the age 50 and older.

AARP, as a producer and user of Internet applications, content, and services, and as a representative of 38 million older Americans who are users and producers of Internet applications, content, and services, strongly believes that an open Internet is a vital component of the American economy and society. AARP has advocated for open Internet principles in broadband markets for over 16 years, beginning at a time when broadband was an emerging technology, and before the term "network neutrality" had even been coined.[35] AARP believes that the issues raised in the *2017 NPRM* are of enormous consequence, with the potential future of Internet innovation and competition hanging in the balance.

A. "Back to the future" is not the approach the Commission should consider

In a speech preceding the release of the *2017 NPRM*, titled "The Future of Internet Regulation," Chairman Pai stated with regard to the upcoming rulemaking "[t]hroughout the discussion that is to come, you will hear from the other side that Title II regulation is the only way to preserve a

[35] See, "Tangled Web: The Internet and Broadband Open Access Policy," Trevor R. Roycroft, Ph.D. January 2001. AARP Public Policy Institute, Washington, D.C. https://assets.aarp.org/rgcenter/consume/d17331_tangled.pdf

free and open Internet. This is a lie."[36] AARP is concerned by the use of such divisive language at the initiation of an important rulemaking. In preparing these comments, AARP has not approached the issues raised in the *2017 NPRM* from one "side" or another. Rather, AARP has addressed the issues raised in the *2017 NPRM* with an eye to sustaining the vibrancy of Internet innovation, investment, and competition. Based on that evaluation, and given the history of behavior of broadband ISPs, and their persistent market power, AARP strongly believes that blocking and discrimination have been real problems in the past, and have the potential to be problems in the future.

B. Other paths to supportable open Internet rules lead nowhere

As suggested by the *2017 NPRM,* AARP has considered paths other than Title II to achieve the pro-consumer and pro-competition objectives associated with neutral broadband Internet access, and AARP will discuss those options below. However, based on its evaluation of the history of the Commission's experience under Title I, and the assessment of other approaches suggested in the *2017 NPRM,* AARP has reached the conclusion that Title II still provides the best path forward to ensure Internet freedom. Going "back to a Title I future" will undermine key protections provided by the *2015 Title Order,* and harm innovation, investment, and the tremendous contribution that Internet technology has brought to the U.S. economy. The "light-touch" framework established with the *2015 Title II Order*, which applied substantial forbearance, contains reasonable "rules of the road" that encourage investment and innovation. While the *2017 NPRM* appears to desire a Title I future for broadband Internet access services, that Title I future is one that the Commission should know by now will not support critical no-

[36] Remarks of FCC Chairman Ajit Pai at the Newseum, "The Future of Internet Freedom" Washington, DC, April 26, 2017. https://www.fcc.gov/document/chairman-pai-speech-future-internet-regulation

blocking rules.[37] Based on a thorough evaluation of the issue, AARP does not believe that a broadband future which includes open Internet protections can be achieved through Title I.

Up to this point, the content that AARP distributes using the Internet, which its members and all Americans ultimately access using broadband connections, is treated on a non-discriminatory basis, thus promoting AARP's ability to educate and inform the age 50 and older and their families. AARP is deeply concerned by the proposals contained in the *2017 NPRM*,[38] which have the potential to turn back the existing *2015 Title II Order's* rules governing broadband Internet access services.[39] If such a course of action is pursued, AARP believes that organizations like AARP will be harmed, as well as, more generally, consumers, innovation, and competition. AARP, after carefully considering the questions and statements contained in the *2017 NPRM,* and evaluating alternatives to the framework created by the *2015 Title II Order*, urges the Commission to continue to maintain Title II authority over broadband Internet access services.

II. Title II has an established history of promoting the public interest

The *2017 NPRM* asserts that for twenty years, prior to the adoption of the *2015 Title II Order*,[40] that a "light-touch" regulatory approach had governed Internet access services.[41] The history of

[37] *2017 NPRM,* ¶80. "We emphasize that we oppose blocking lawful material. The Commission has repeatedly found the need for a no-blocking rule on principle, asserting that 'the freedom to send and receive lawful content and to use and provide applications and services without fear of blocking is essential to the Internet's openness.'"
[38] *In the Matter of Restoring Internet Freedom*, WC Docket No. 17-108, Notice of Proposed Rulemaking, May 23, 2017. Hereinafter, *2017 NPRM*.
[39] Broadband Internet access services are defined in the *2015 Title II Order* as: "A mass-market retail service by wire or radio that provides the capability to transmit data to and receive data from all or substantially all Internet endpoints, including any capabilities that are incidental to and enable the operation of the communications service, but excluding dial-up Internet access service."
[40] *In the Matter of Protecting and Promoting the Open Internet*, GN Docket No. 14-28, Report and Order on Remand, Declaratory Ruling, and Order, March 12, 2015, hereinafter *2015 Title II Order*.
[41] *2017 NPRM,* ¶1.

regulation of Internet access services[42] is more complex than the *2017 NPRM* recognizes, and Title II regulation of Internet access services was a fact of life during the first 10 years following Internet privatization in 1995.

When the Internet was privatized in 1995, residential customers accessed this new technology platform by using their telephone line and a computer modem. Because the telephone line was regulated under Title II, there was no potential for blocking or discrimination—the telephone company could not tell consumers whom they could or could not call. By selecting the dial-up ISP of their choice, consumers benefitted from the combination of Title II regulation and the dial-up ISP competition that it enabled. Competition and innovation were promoted, as evidenced by the rapid growth of new applications and services, not to mention a highly competitive dial-up ISP market, which, by the year 2000, had more than 7,400 providers nationwide.[43]

Similarly, early Internet service and content providers who wanted a high-speed connection to the Internet to host their web sites could purchase bandwidth at tariffed rates from the regulated telephone company. Later, mass-market broadband services offered by telephone companies emerged. These high capacity broadband telecommunications services were also covered under Title II. As noted by this Commission:

> We conclude that advanced services are telecommunications services. The Commission has repeatedly held that specific packet-switched services are "basic services," that is to say, pure transmission services. xDSL and packet switching are simply transmission

[42] Internet access services represent only a portion of the technology that makes up the network of networks known as the Internet. Internet access services connect consumers to the network of networks that makes up the global Internet. Internet access services are provided using wireline technologies that reach consumers residences, such as telephone company digital subscriber line (DSL) services, cable company broadband, and by competitive entrants, such as Google Fiber or WOW!. Internet access services may also be provided by wireless mobility providers, fixed wireless service providers, and satellite providers.

[43] "The Best and Worst ISPs," *PC World*, November 2000.

> technologies. To the extent that an advanced service does no more than transport information of the user's choosing between or among user-specified points, without change in the form or content of the information as sent and received, it is "telecommunications," as defined by the Act. Moreover, to the extent that such a service is offered for a fee directly to the public, it is a "telecommunications service."[44]

The Title II regulatory framework thus prevented wireline broadband providers from blocking, throttling, or otherwise interfering with broadband Internet access, and Internet innovation, investment, and competition resulted.

This Commission has also previously recognized that the key to the success of the open Internet is the lack of interference from the network that connects the computers that are located at the network edge. This lack of "gatekeepers" promoted an innovation engine unlike any other, a fact which this Commission has previously noted:

> Like electricity and the computer, the Internet is a "general purpose technology" that enables new methods of production that have a major impact on the entire economy. The Internet's founders intentionally built a network that is open, in the sense that it has no gatekeepers limiting innovation and communication through the network. Accordingly, the Internet enables an end user to access the content and applications of her choice, without requiring permission from broadband providers. *This architecture enables innovators to create and offer new applications and services without needing approval from any controlling entity, be it a network provider, equipment manufacturer, industry body, or government agency.* End users benefit because the Internet's openness allows new technologies to be developed and distributed by a broad range of sources, not just by the companies that operate the network. For example, Sir Tim Berners-Lee was able to

[44] *In the Matters of Deployment of Wireline Services Offering Advanced Telecommunications Capability, Petition of Bell Atlantic Corporation for Relief from Barriers to Deployment of Advanced Telecommunications Services, Petition of U S WEST Communications, Inc. For Relief from Barriers to Deployment of) Advanced Telecommunications Services);Petition of Ameritech Corporation to Remove Barriers to Investment in Advanced Telecommunications Technology; Petition of the Alliance for Public Technology Requesting Issuance of Notice of Inquiry and Notice of Proposed Rulemaking to Implement Section 706 of the 1996 Telecommunications Act; Petition of the Association for Local Telecommunications Services (ALTS) for a Declaratory Ruling Establishing Conditions Necessary to Promote Deployment of Advanced Telecommunications Capability Under Section 706 of the Telecommunications Act of 1996 ; Southwestern Bell Telephone Company, Pacific Bell, and Nevada Bell Petition for Relief from Regulation Pursuant to Section 706 of the Telecommunications Act of 1996 and 47 U.S.C. § 160 for ADSL Infrastructure and Service.* CC Docket No. 98-147, CC Docket No. 98-11, CC Docket No. 98-26, CC Docket No. 98-32, CCB/CPD No. 98-15, RM 9244, CC Docket No. 98-78, CC Docket No. 98-91. FCC 98-188. Memorandum Opinion and Order, and Notice of Proposed Rulemaking, August 7, 1998, ¶35.

> invent the World Wide Web nearly two decades after engineers developed the Internet's original protocols, without needing changes to those protocols or any approval from network operators. [45]

Internet openness depends on the ability of consumers to access edge providers unimpeded by the provider of Internet access services. This lack of a gatekeeper has promoted competition, innovation, and investment by both edge providers and by broadband Internet access providers. The rich history of Title II is missing from the *2017 NPRM*. For example, the *2017 NPRM* states that Title II regulation of broadband Internet access services only began in 2015, following the FCC's adoption of the *2015 Title II Order*.[46] This is simply incorrect. The lack of historical perspective contributes to the deeply flawed proposals contained in the *2017 NPRM*.

A. Broadband investment was robust under the first Title II experience

Title II governed consumer broadband services for an extended period after the Internet was first privatized, and telephone companies regulated under Title II engaged in investment at levels that have not been duplicated. Recognizing consumer demand for high-speed connections, telephone companies began to offer mass-market broadband services like DSL. During this period, telephone companies invested billions of dollars to keep up with customer demand for broadband, and the fact that telephone companies were governed by Title II did not stand in the way of that investment. As explained by Bellsouth:

> Over the last several years, the demand for high-speed access to the Internet has increased substantially. . . . In response, we have deployed digital subscriber line (DSL) products which enhance the existing switched lines and provide Internet access speeds up to 1.5 Megabits per second, up to 30 times faster than today's fastest dial-up modems. . . .
>
> We have approximately 10.3 million access lines qualified to offer DSL and ended 2000 with 215,000 customers served over our DSL facilities. We plan to increase our coverage

[45] *In the Matter of Preserving the Open Internet, Broadband Industry Practices*, GN Docket No. 09-191, WC Docket No. 07-52, Report and Order, December 23, 2010, ¶13, citations omitted, emphasis added.
[46] *2017 NPRM*, ¶¶1, 10, 24, 50, and 70.

> to approximately 16.0 million qualified access lines and the total customers served over our DSL facilities to 600,000 by the end of 2001.[47]

Similarly, SBC Communications launched its "Project Pronto" when under Title II:

> In 1999, as the first post-Ameritech merger initiative, we announced a $6 billion initiative designed to transform the company into the largest single provider of advanced broadband services in America (Project Pronto). Project Pronto is expected to create a vast, sophisticated broadband platform that will allow high-speed voice, data and video services to be provided via Digital Subscriber Line (DSL) services. Project Pronto is expected to be substantially completed by the end of 2003, and was approximately 34 percent completed at December 31, 2000. At December 31, 2000 we had approximately 767,000 subscribers.[48]

The activities of SBC and Bellsouth during the Title II period were typical, which is clearly illustrated by data compiled by USTelecom. For wireline telephone companies,[49] the Title II period was the heyday of capital investment.

Data in Figure 3 shows that capital expenditures of $434 billion were associated with the nine years 1996-2004, when telephone company broadband was classified as a Title II telecommunications service.[50] For the ten Title I years (2006-2015), wireline capital expenditures were $286 billion.[51] Likewise, as noted in the *2015 Open Internet Order,* "between 1993 and 2009 (while voice was the primary driver of mobile revenues), the mobile industry invested more than $271 billion in building out networks…"[52] The reclassification of wireline broadband as a Title I service in 2005 did not result in wireline investment reaching the peaks

[47] Bellsouth Form 10-K for the year ending December 31, 2000, pp. 7-8.
[48] SBC Form 10-K for the year ending December 31, 2000.
[49] I.e., telephone companies, no cable or wireless included.
[50] Figure 3 is reproduced from "Broadband Investment Ticked Down in 2015," Research Brief prepared by Patrick Brogan, Vice President of Industry Analysis, USTelcom Association, December 14, 2016. https://www.ustelecom.org/sites/default/files/Broadband%20Investment%20Down%20in%202015.pdf
[51] This analysis treats 2005 as a watershed year, leaving it out of either period. Adding 2005's $26 billion in capital expenditures to either period does not change the outcome by much—in either case, there was substantially more investment in the Title II period.
[52] *2015 Title II Order*, ¶39.

that it achieved in the early 2000s. The USTelecom data casts doubt on the *2017 NPRM's* narrative that Title II is incompatible with broadband investment.

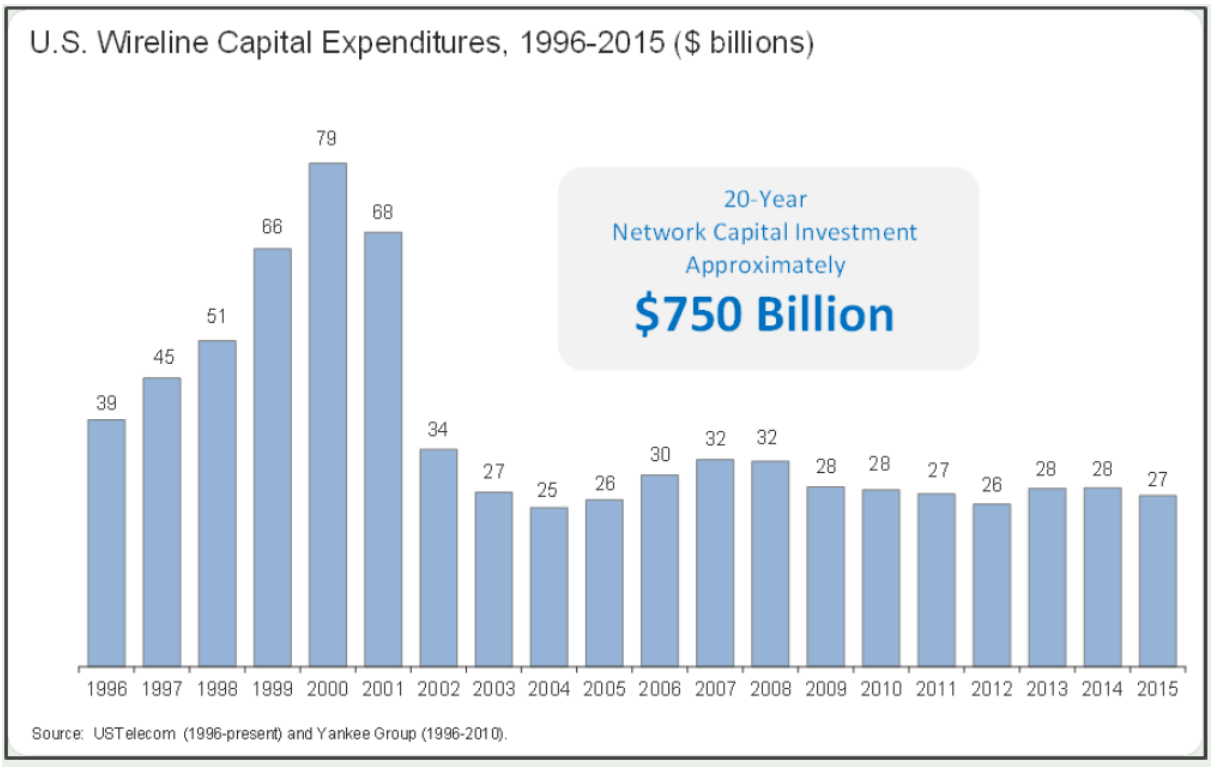

Figure 3: US Telecom data on wireline network capital investment (no cable or wireless)

B. The *2015 Title II Order* solved a long-standing problem

The *2017 NPRM* contains a paradox. The *2017 NPRM* states that the Commission opposes the blocking of lawful content, and notes that the Commission has repeatedly found that the need for a no-blocking rule.[53] Thus, the foundation of the concept of Network Neutrality—no blocking—is once again in the forefront of the Commission's efforts. On the other hand, the *2017 NPRM* is also critical of the *2015 Title II Order*,[54] which reclassified broadband Internet access service under Title II, and finally solved the problem that had previously dogged the Commission as it

[53] *2017 NPRM*, ¶80.
[54] Among other factors, the *2017 NPRM* states that the *2015 Title II Order* "has put at risk online investment and innovation, threatening the very open Internet it purported to preserve." *2017 NPRM*, ¶4.

attempted to enforce core no-blocking rules.[55] Namely, the Commission has repeatedly been told by the D.C. Circuit that Title I classification of broadband Internet access service does not provide the Commission with the needed authority to prevent blocking.[56] AARP believes that the Commission cannot have it both ways when it comes to the desired no-blocking rule and Title I classification. The history of the past seven years makes it clear that if the Commission reclassifies broadband as a Title I service, it will lose its ability to protect consumers and competition associated with the most important technology platform that humans have created—the broadband Internet. This would be a most unfortunate outcome. By moving to Title I, the Commission will all but guarantee that it will not be able to achieve its stated objective of preventing the blocking of access to lawful applications, content, and services.

C. The *2015 Title II Order* does not apply "utility-style" regulation

While the *2017 NPRM* is highly critical of the *2015 Open Internet Order*, asserting that the order resulted in "utility-style" regulation of the "Internet,"[57] the regulatory framework created by the *2015 Title II Order* did not impose the full complement of public-utility obligations on broadband ISPs. Through its forbearance action, the Commission left certain core authorities in place,[58] and refrained from imposing "public-utility" regulations, such as those associated with rates, tariffing, network unbundling, and universal service support.[59] The result was "enough Title II" to satisfy the D.C. Circuit that a foundation for the open Internet rules had been established, and a reasonable application of the Commission's forbearance authority had been achieved.[60] With Title II, the Commission finally gained the ability to prevent actions on the part

[55] See *United States Telecom Association, et al., v. F.C.C.* 825 F. 3d, 674 713.
[56] See, *Comcast v. FCC*, 600 F. 3d 642 (2010). *Verizon v. FCC*, 740 F.3d 623 (2014).
[57] *2017 NPRM,* ¶3.
[58] *2015 Title II Order,* ¶456.
[59] *2015 Title II Order*, ¶37.
[60] 825 F. 3d, 674 726-732.

of broadband ISPs that could harm consumers, undermine competition, and discourage investment.

The *2015 Title II Order* imposed a light-touch regulatory framework. The Commission gained the ability to act as a referee for disputes associated with broadband Internet access service, as well as those associated with interconnection. The Commission informed broadband providers of the rules of the road with its "bright line rules," and did not impose "utility-style" regulatory requirements, such as price or profit regulation, service quality standards, or universal service contributions. Given the nature of the rules—no blocking, no throttling, no paid prioritization, and network transparency—the only actors which might have to change their behavior would be bad actors.

In summary, while the *2017 NPRM* indicates that a "light-touch" regulatory approach is needed,[61] given the framework established by the *2015 Title II Order,* which exercised forbearance from the bulk of Title II requirements, AARP questions whether any "lighter touch" is feasible. As the Commission is aware, authority to enforce basic open Internet rules, such as no-blocking requirements, has failed under Title I. It seems likely that reclassification will not enable the Commission to achieve its stated objective of maintaining the vital no-blocking rules.[62] Any "lighter touch" will increase the risk of harm to consumers, competition, and investment.

[61] *2017 NPRM,* Section IV.
[62] *2017 NPRM,* ¶80.

III. The *2017 NPRM*'s regulatory framework will not support an open Internet

The *2017 NPRM* proposes to return to the regulatory framework that existed prior to the *2015 Title II Order*, in an effort to support a "free and open Internet."[63] "Restoring broadband Internet access service to its previous status as an information service subject to Title I is in the public interest because it will alleviate the harms caused by Title II reclassification."[64] However, the *2017 NPRM* also recognizes the potential for mischief on the part of broadband ISPs, such as blocking of lawful content, and seeks comment on "the appropriate means to achieve this outcome [no-blocking] consistent with the goals of maintaining Internet freedom, maximizing investment, and respecting the rule of law."[65] For the reasons discussed below, AARP believes that there is substantial evidence that a Title I approach is not sufficient to support a "free and open Internet," and that the *2015 Title II Order's* approach is in fact consistent with Internet freedom, investment, and the rule of law.

A. The need for ex ante regulation

The *2017 NPRM* raises the question of whether *ex ante* regulatory intervention in the market is necessary, and whether there have been additional concrete incidents that threaten the "four Internet Freedoms."[66] AARP reminds the Commission that ISPs such as Verizon have indicated that but for regulatory constraints, that company would be pursuing alternative pricing models, including charging edge providers for the delivery of traffic.[67] We also know that Verizon and Comcast refused to upgrade interconnection ports for Netflix traffic, thus harming Netflix

[63] *2017 NPRM*, ¶70.
[64] *2017 NPRM*, ¶44.
[65] *2017 NPRM*, ¶80.
[66] *2017 NPRM*, ¶77.
[67] Statement of Verizon attorney Helgi Walker during oral arguments in *Verizon v. FCC*, September 9, 2013. In a discussion with the bench regarding Verizon actions absent rules to the contrary, Ms. Walker states "I'm authorized to state from my client today that but for these rules we would be exploring those types of arrangements." Audio transcript available at: https://www.c-span.org/video/?314904-1/verizon-v-federal-communications-commission-oral-argument&start=5651 at 27:32-29:32.

customers who had been sold "Internet access" by those service providers (an offer which apparently meant "Internet access, unless you want to watch Netflix").[68] As is discussed in a later section of these comments, broadband markets are characterized by market power.[69] Stripping away the Title II framework would open the door for broadband ISPs to leverage their market power, with blocking, throttling, or discrimination being the result.

1. Antitrust is not a reasonable alternative to the *2015 Open Internet Rules*

The *2017 NPRM* also raises the issue of whether it would be preferable to rely on existing antitrust regulations rather than the *2015 Title II Order's* rules to address "various forms of anticompetitive conduct, such as collusion and vertical restraints."[70] The Commission's *2015 Title II Order* provides an approach that is superior to the antitrust backstop. Antitrust litigation is expensive, and the costs of antitrust litigation for upstart edge providers would smother innovation and investment at the network edge. In addition, antitrust actions are notoriously slow moving, with criminal investigations typically taking one-to-two years.[71] Of course, antitrust actions can drag on for a longer period, such as those associated with Microsoft's actions toward Netscape and other firms, or the divestiture of AT&T.

Beyond the costs and delays associated with traditional antitrust, the industry-wide approach found with the *2015 Title II Order* also provides the benefits of consistent rules of the road across broadband providers. The same pro-competition rules applying to all broadband ISPs promotes beneficial network effects. Edge providers will face similar technological opportunities and constraints regardless of which broadband ISP happens to be carrying their

[68] See, for example, "This Is Why Netflix Just Got So Blazingly Fast," *Time*, April 15, 2014. http://time.com/62903/netflix-comcast-speed-boost/
[69] See Sections VII. A & B.
[70] *2017 NPRM*, ¶78.
[71] Practicing Law Institute, "Overview of the U.S. Antitrust Laws," p. 17. http://www.pli.edu/product_files/Titles/4153/58678_sample01_20141108153021.pdf

content. Relying on the antitrust alternative, with its characteristic case-by-case approach, could result in segmented regulation of broadband markets, with some providers—those whose conduct has been required to conform to procompetitive behavior—offering superior opportunities for consumers and edge providers, as opposed to other providers that were not subject to a suit, or which were able to negotiate a weaker level of protection for consumers and edge providers. The promotion of network effects arising from a uniform set of rules applying across the industry is a substantial benefit that is not likely to arise through the antitrust alternative.

B. Bright-line rules

The *2017 NPRM* addresses the *2015 Open Internet Order's* "bright-line" rules. Unlike the general conduct standard which is discussed below, the bright-line rules identify specific actions that could be taken by broadband ISPs that would interfere with the ability of Internet users to access the applications, content, and services of their choice, and which would also impact the ability of edge providers to reach their customers. By singling out the behaviors associated with the bright-line rules, broadband ISPs are fully informed regarding certain behaviors that are contrary to open Internet principles.

1. No-blocking rule

The *2017 NPRM* notes that "the Commission has repeatedly found the need for a no-blocking rule *on principle*,"[72] and reiterates opposition to the blocking of lawful content. AARP adds that the Commission has also found the need for a no blocking rule for cause:

> Comcast subscribers began to notice that they had problems using BitTorrent and similar technologies over their Comcast broadband connections. Last year, their complaints began to receive widespread attention in the press. When first confronted with these press reports, Comcast — the nation's second largest provider of broadband Internet access

[72] *2017 NPRM*, ¶80, emphasis added.

> services— misleadingly disclaimed any responsibility for the customers' problems. For example, a Comcast spokesman stated: "We're not blocking any access to any application, and we don't throttle any traffic."[73]

Of course, the Commission discovered that Comcast was being less than forthright regarding its actions against BitTorrent, and was in fact blocking consumer access to a legal Internet application.

The *2017 NPRM* also questions whether the elimination of the no-blocking rule would result in continued compliance on the part of broadband ISPs, noting that prior to 2015, some ISPs voluntarily complied with the no-blocking principle.[74] AARP does not believe that a "trust me" approach is sufficient as broadband ISPs have economic incentives to discriminate, and these incentives are likely to increase, given the growing set of edge services that they provide.[75] Stripping the Commission of its established authority to prevent blocking would send a signal that there is no longer a "cop on the beat," which could make misbehavior more likely.

The *2017 NPRM* also questions the need for a no-blocking rule and asks for suggestions for an alternative to the existing approach to the no-blocking requirement.[76] With regard to rules preventing blocking, the Commission has been down the Title I path before, and AARP believes that the best way for the Commission to prevent blocking is to continue with a no-blocking rule that is supported by Title II. The Commission's previous efforts to enforce a no-blocking rule under Title I have been rejected by review courts, precisely because those alternative approaches

[73] *In the Matters of Formal Complaint of Free Press and Public Knowledge Against Comcast Corporation for Secretly Degrading Peer-to-Peer Applications Broadband Industry Practices, Petition of Free Press et al. for Declaratory Ruling that Degrading an Internet Application Violates the FCC's Internet Policy Statement and Does Not Meet an Exception for "Reasonable Network Management"* File No. EB-08-IH-1518, WC Docket No. 07-52 Memorandum and Order, August 20, 2008, ¶6.
[74] *2017 NPRM*¸ ¶80.
[75] See discussion in Section III. B.2.
[76] *2017 NPRM,* ¶¶80-81.

require common carrier principles. As noted by the D.C. Circuit in the *Verizon v. FCC* case, no-blocking implies common carrier requirements:

> No one disputes that a broadband provider's transmission of edge-provider traffic to its end-user subscribers represents a valuable service: an edge provider like Amazon wants and needs a broadband provider like Comcast to permit its subscribers to use Amazon.com. . . . More important, the *Open Internet Order* imposes this very duty on broadband providers: given the *Open Internet Order's* anti-blocking and anti-discrimination requirements, if Amazon were now to make a request for service, Comcast must comply. That is, Comcast must now "furnish . . . communication service upon reasonable request therefor."[77]

The experience to date suggests that the only way to have an enforceable no-blocking rule is to maintain Title II classification of broadband Internet access services.

Other methods outside of Title II are also flawed. For example, in the Commission's *2014 Open Internet NPRM*,[78] a proposal for enforcing the no-blocking rule through "fast-lanes" and discrimination, combined with minimum levels of service performance was floated.[79] It is, however, clear that such a proposal also required Title II authority. Because the no-blocking provision required that non-fast-lane services remain "effectively usable,"[80] the approach advanced in the *2014 Open Internet NPRM* implicitly required common-carrier price and service quality standards. This fact was noted in Judge Silberman's dissent in the *Verizon v. FCC* case. On the matter of the potential for minimum performance mandates, combined with the ability of broadband ISPs to discriminate, Judge Silberman noted:

[77] *Verizon v. FCC,* 740 F.3d 623, 653-654. Hereinafter, *Verizon v. FCC.*
[78] *In the Matter of Protecting and Promoting the Open Internet*, GN Docket No. 14-28, Notice of Proposed Rulemaking, May 15, 2014. Hereinafter, *2014 Open Internet NPRM*
[79] *2014 Open Internet NPRM,* ¶97.
[80] *2014 Open Internet NPRM,* ¶101.

> "while there is a possibility that a 'fast lane' Internet service might be offered on a non-common carriage basis, the service that most users receive under this rule would still have to be offered as common carriage, at a regulated price of zero."[81]

The Commission has already failed to find another pathway to an enforceable no-blocking requirement. Title II classification of broadband Internet access services enables the key no-blocking protection that is needed to ensure that all lawful content and services can be used over broadband connections. The best path forward on the no-blocking issue is Title II.[82]

2. No-throttling rule

The no-throttling rule addresses potential discriminatory behavior that does not rise to the level of outright blocking. As noted in the *2015 Title II Order*, the prohibition on throttling is associated with "degraded" customer service, and is outside of "reasonable network management" practices:

> A person engaged in the provision of broadband Internet access service, insofar as such person is so engaged, shall not impair or degrade lawful Internet traffic on the basis of Internet content, application, or service, or use of a non-harmful device, subject to reasonable network management.[83]

The *2017 NPRM* raises the question of "when is 'throttling' harmful to consumers?"[84] Given the *2015 Title II Order's* definition of throttling, this behavior is *always* harmful to consumers. Regarding throttling, the negative impact of throttling on consumers can arise with even subtle interference with the user's experience, resulting in significant harms.

For example, studies performed by Akamai found that consumer expectations associated with the time an e-commerce web page should load have significantly dropped over time.[85] Similarly,

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[81] *Verizon v. FCC*, Silberman dissent. 740 F.3d 623 668.
[82] The prospects of supporting a no-blocking rule under Section 230 of the Communications Act are discussed in Section IV. C.
[83] *2015 Title II Order*, ¶119.
[84] *2017 NPRM,* ¶83.
[85] Akamai Reveals 2 Seconds as the New Threshold of Acceptability for eCommerce Web Page Response Times. http://www.akamai.com/html/about/press/releases/2009/press_091409.html ; See also, "End-Users' Web Experience

research conducted by Google found that consumers' decisions to stay on a page can be made in *milliseconds*. According to a Google study "People will visit a Web site less often if it is slower than a close competitor by more than 250 milliseconds (a millisecond is a thousandth of a second)."[86] Google studies also note that 40 percent of consumers will leave a web page that takes more than 3 seconds to load.[87] Thus, it would not take much "throttling" for consumers and competition to be harmed.

Regarding streaming media, the *impact* of ISP interference with traffic flows was clearly illustrated with Netflix customers' experiences with broadband performance associated with the 2013/2014 Verizon and Comcast refusals to upgrade interconnection ports. Netflix customers experienced dramatic declines in streaming performance when using their Netflix service, and customers were harmed:

> The bottleneck has made Netflix unwatchable for Jen Zellinger, an information-technology manager from Carney, Md., who signed up for the service last month. She couldn't play an episode of "Breaking Bad" without it stopping, she said, even after her family upgraded their FiOS Internet service to a faster, more expensive package.
>
> "We tried a couple other shows, and it didn't seem to make any difference," she said. Mrs. Zellinger said she plans to drop her Netflix service soon if the picture doesn't improve, though she will likely hold on to her upgraded FiOS subscription.[88]

Expectations Just Keep Getting Higher," https://blogs.akamai.com/2012/11/end-users-web-experience-expectations-just-keep-getting-higher.html ; see also, "Great Expectations: 47% of Consumers Want a Web Page to Load in Two Seconds or Less, *Wired*, June 5, 2014, http://insights.wired.com/profiles/blogs/47-of-consumers-expect-a-web-page-to-load-in-2-seconds-or-less#axzz4jbZZGqcx ; see also, "Online Consumer Expectations For 2016," https://www.digitaldoughnut.com/articles/2016/january/online-consumer-expectations-for-2016

[86] "For Impatient Web Users, an Eye Blink Is Just Too Long to Wait," *New York Times*, February 29, 2012. http://www.nytimes.com/2012/03/01/technology/impatient-web-users-flee-slow-loading-sites.html?pagewanted=all

[87] Why Marketers Should Care About Mobile Page Speed, Think with Google, July 2016. https://www.thinkwithgoogle.com/marketing-resources/experience-design/mobile-page-speed-load-time/

[88] "Netflix-Traffic Feud Leads to Video Slowdown," *Wall Street Journal*, February 18, 2014. https://www.wsj.com/articles/netflixtraffic-feud-leads-to-video-slowdown-1392772268

While the technical cause of the throttling was the refusal of Verizon and Comcast to upgrade interconnection ports, which suggests ISP interference at a higher level of the broadband access network, (as opposed to traffic shaping, which broadband ISPs have the ability to implement for traffic already on their network), the *impact on consumers* was identical to a throttling violation—the legal content of their choice was slowed due to the broadband ISP's actions.[89] The no-throttling rule is necessary to prevent conduct that would impair or degrade content, applications, or services that compete with a broadband provider's affiliated content.[90]

The *2017 NPRM* asks "[d]oes the no-throttling rule harm latency-sensitive applications and content?"[91] This question suggests that broadband ISP networks are congested, i.e., that some traffic might benefit from the selective slowing down of other traffic. This action, should it be required, could conceivably fall under the "reasonable network management" exception to the no-throttling rule, however, it seems doubtful that broadband ISP networks are congested. For example, during the Netflix/Verizon interconnection port slow-down, Verizon released the diagram shown in Figure 4. That diagram shows that Verizon's last-mile and second-mile networks are lightly loaded during peak utilization periods. In such an environment, throttling is all the more objectionable, and the need to slow traffic for "reasonable network management" also appears to be much less likely.[92] Figure 4 shows that Verizon regional mesh networks run at less than 50 percent of peak period capacity, and the border routers run at about 60 percent of

[89] See, for example, Slow Comcast speeds were costing Netflix customers, *CNN*, August 29, 2014, http://money.cnn.com/2014/08/29/technology/netflix-comcast/index.html

[90] The Netflix/Comcast/Verizon interconnection port issue also illustrates the need for the Commission to maintain the ability to address disputes associated with interconnection. Consumers need protection from unilateral actions on the part of broadband ISPs that can negatively impact the performance of edge provider services.

[91] *2017 NPRM*, ¶83.

[92] The Verizon diagram was originally posted in a July 10, 2014 Verizon blog titled "Why is Netflix buffering? Dispelling the congestion myth." The text of the post remains; however, the diagram has been removed. http://www.verizon.com/about/news/why-is-netflix-buffering-dispelling-the-congestion-myth . A copy is maintained at: https://arstechnica.com/information-technology/2014/07/theres-no-congestion-verizon-says-despite-continued-netflix-problems/

peak period capacity. Other information in the diagram suggests network design with substantial excess capacity, in such an environment, slowing some packets to make way for other packets is unnecessary.

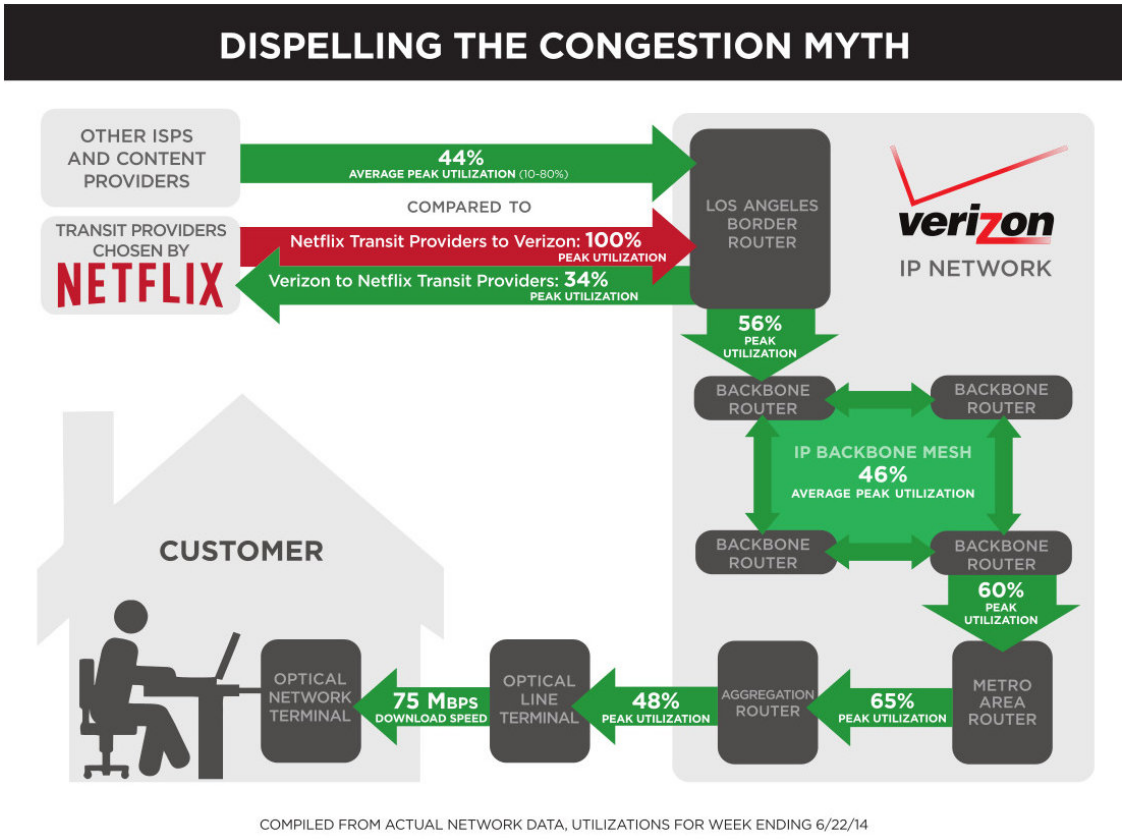

Figure 4: Verizon network utilization data

Alternatively, the *2017 NPRM* asks whether the no-throttling rule prevents product differentiation among ISPs.[93] Given the definition of throttling contained in the *2015 Title II Order*, it does not seem reasonable that discriminatory impairment and degradation of traffic would contribute to any reasonable product differentiation effort.

[93] *2017 NPRM*, ¶83.

The need for a bright-line rule addressing throttling is even more urgent given the growing variety of services into which broadband ISPs are expanding. Broadband providers are currently taking positions in key industries that may result in their gaining competitive advantage in areas such as home automation, smart grid, "Internet of Things," and medical monitoring.[94] Absent policies that manage ongoing market power in last-mile broadband networks, the growth of these technologies and related network effects that can arise from broadband will be limited. Unless the Commission delivers pro-competition and pro-innovation regulatory *certainty*, the exponential growth in economic benefits that have been enabled by an open Internet to date will be threatened, and the foundation of future network effects will be handed to broadband gatekeepers who have the power to shape technology for narrow gain.

[94] See, for example, "Verizon Gains FDA Clearance for Remote Health Monitoring Solution," August 8, 2013, Verizon Press Release, http://newscenter.verizon.com/corporate/news-articles/2013/08-08-fda-clearance-for-remote-health-monitoring/#sthash.ZG31xMpR.dpuf . See also, http://www.verizonwireless.com/b2c/device/connected/sureresponse?&zipRdr=y ; http://www.verizon.com/support/residential/homecontrol/home+monitoring+and+control/overview/129406.htm . See also, "AT&T Partners with VRI on Remote Medical Monitoring Service, NTCA, May 4, 2012, http://www.ntca.org/new-edge/other/att-partners-with-vri-on-remote-medical-monitoring-service . See also, https://my-digitallife.att.com/learn/ ; and https://www.wireless.att.com/businesscenter/solutions/industry-solutions/vertical-industry/healthcare/remote-patient-monitoring.jsp .
See also, http://www.verizonenterprise.com/solutions/utility/utility-solutions/smartgrid/ http://about.att.com/mediakit/smartgrid . See also, http://blogs.wsj.com/digits/2014/06/16/udacity-att-team-up-in-online-ed/ ; http://www.verizonenterprise.com/worldwide/industry/public_sector/education/ See also: Comcast Launches New Xfinity Home Control and Energy Management Service, June 10, 2013. http://corporate.comcast.com/news-information/news-feed/comcast-launches-new-xfinity-home-control-and-energy-management-service-2
Xfinity Home: A total home security solution. https://www.xfinity.com/home-security.html
XFINITY Home: A Leader in Smart Grid Innovation, April 12, 2013. http://corporate.comcast.com/comcast-voices/xfinity-home-a-leader-in-smart-grid-innovation
AT&T Smart Grid solutions, https://www.business.att.com/enterprise/Service/internet-of-things/smart-cities/iot-smart-grid/
AT&T Internet of Things, https://www.business.att.com/enterprise/Portfolio/internet-of-things/?WT.srch=1&source=ECPS0000000PSM00P&wtpdsrchprg=AT%2526T%2520ABS&wtpdsrchgp=ABS_SEARCH&wtPaidSearchTerm=at%26t%20internet%20of%20things&wtpdsrchpcmt=at%26t%20internet%20of%20things&kid=kwd-112567478460&cid=783501317
Verizon Internet of Things, http://www.verizonenterprise.com/products/internet-of-things/?keyword=p14227134316&gclid=CjwKEAjwse7JBRCJ576SqoD7lCkSJABF-bKu_wjVqSajg9OJ44Dyre_rnWOKBDKVMVWPcoVzlf4cGRoCmY_w_wcB&dclid=CKSerIO5s9QCFce2swodczoO7Q
Verizon Smart energy and utilities solutions, Simplify how your grid works with an intelligent IoT platform. http://www.verizonenterprise.com/industry/utility/

3. The no-paid-prioritization rule

The *2017 NPRM* raises questions regarding the *Title II Order's* no-paid-prioritization rule, starting with whether the Commission has the authority to retain it.[95] AARP believes that the Commission's authority to retain the rule is a settled matter. Responding to arguments made against the no-paid-prioritization rule by Alamo Broadband, Inc., the D.C. Circuit responded as follows:

> In its challenge to the anti-paid-prioritization rule, petitioner Alamo contends that, even with reclassification of broadband as a telecommunications service, the Commission lacks authority to promulgate such a rule under section 201(b) of Title II and section 303(b) of Title III. The Commission, however, grounded the rules in "multiple, complementary sources of legal authority"—not only Titles II and III, but also section 706 of the Telecommunications Act of 1996 (now codified at 47 U.S.C. § 1302). . . . . As to section 706, this court concluded in Verizon that it grants the Commission independent rulemaking authority. . . . Alamo nonetheless argues that the Commission lacks authority to promulgate rules under section 706. It rests that argument on a claim that this court's contrary conclusion in *Verizon* was dicta. . . .
>
> Alamo misreads *Verizon.* Our decision in that case considered three rules from the 2010 Open Internet Order: an anti-blocking rule, an anti-discrimination rule, and a transparency rule. *See id.* at 633. We determined that section 706 vests the Commission "with affirmative authority to enact measures encouraging the deployment of broadband infrastructure" and that the Commission had "reasonably interpreted section 706 to empower it to promulgate rules governing broadband providers' treatment of Internet traffic." *Id.* at 628. In doing so, we also found that the Commission's justification for those rules — "that they will preserve and facilitate the `virtuous circle' of innovation that has driven the explosive growth of the Internet" — was reasonable and supported by substantial evidence. . . .
>
> Unfortunately for Alamo, *Verizon* established precedent on the existence of the Commission's rulemaking authority under section 706 and thus controls our decision here. Consequently, we reject Alamo's challenges to the Commission's section 706 authority and to the anti-paid prioritization rule.[96]

[95] *2017 NPRM*, ¶85.
[96] 825 F. 3d 674, 733-734.

The *2017 NPRM* also raises questions as to whether the no-paid-prioritization rule is still necessary.[97] AARP believes that this rule is still essential to ensure the continued benefits of an open Internet. Paid prioritization will generate significant problems that can only be solved by more regulation. Paid prioritization opens the door for discrimination, and would place the Commission in the position of needing to ensure that undue discrimination does not occur, which certainly requires Title II authority. With paid prioritization, significant harms to consumers, competition, and innovation could arise:

- Pay-for-priority and fast lanes will cause customer confusion and will degrade the value of broadband connections. Incentives consumers would have to upgrade to higher capacity broadband connections will be muted, as the full value of more bandwidth can only be achieved if *all web sites and content* have the potential to be delivered at the "up to" speed for which broadband subscribers pay.

- Paid prioritization will harm edge providers. Each broadband provider holds bottleneck access to the edge provider's potential users, viewers, or customers.[98] Thus, the edge provider would have to negotiate with a large number of broadband providers to reach fast-lane agreements to cover all broadband mass-market customers. According to BroadbandNow.com, there are 872 DSL providers and 472 cable broadband providers in the U.S.[99] Paid prioritization and fast lanes would introduce substantial transaction costs for edge providers, thus draining operating funds, and reducing edge provider profitability. If the edge provider has the financial wherewithal and resources to negotiate with all broadband providers to purchase fast lane services, here too, the profitability of the firm is negatively affected as payment for superior access to customers now comes at a premium—edge investment and innovation would be harmed as a result.

- Fast lanes could fragment Internet applications, content, and services. If a startup edge provider found the prospect of negotiating with all broadband ISPs for fast lane services too cumbersome, the startup might not be able to deliver the service to all broadband subscribers, leaving some end users without the ability to access the startup's services, or to use them at their full potential.

[97] *2017 NPRM*, ¶85.
[98] See discussion in Section VII. B.
[99] http://broadbandnow.com/All-Providers

- Fragmentation of edge services would reduce the value of broadband connections to consumers, and as the Commission noted in the 2010 *Open Internet Order*:

> Continued operation of this virtuous circle,[100] however, depends upon low barriers to innovation and entry by edge providers, which drive end-user demand. Restricting edge providers' ability to reach end users, and limiting end users' ability to choose which edge providers to patronize, would reduce the rate of innovation at the edge and, in turn, the likely rate of improvements to network infrastructure.[101]

Increases in edge provider transaction costs will lead to lower profits at the network edge and lower levels of edge innovation, thus undermining incentives for broadband adoption, and broadband investment.

In addition to these disadvantages, the 2010 *Open Internet Order* summarized as follows regarding the problems with "pay-for-priority" schemes:

- Pay-for-priority would represent a significant departure from historical and current practice on the Internet.
- Pay-for-priority arrangements could raise barriers to entry on the Internet by requiring fees from edge providers, as well as transaction costs arising from the need to reach agreements with one or more broadband providers to access a critical mass of potential end users.
- Pay-for-priority arrangements may particularly harm non-commercial end users, including individual bloggers, libraries, schools, advocacy organizations, and other speakers, especially those who communicate through video or other content sensitive to network congestion.
- Broadband providers that sought to offer pay-for-priority services would have an incentive to limit the quality of service provided to non-prioritized traffic.[102]

AARP believes that this logic continues to be valid, and that the Commission should continue the flat ban on paid prioritization of traffic.

[100] The "virtuous circle" identified in the *Open Internet Order* is based on unhindered innovation by edge providers driving the demand for higher quality broadband, which in turn results in broadband providers upgrading facilities to meet that demand. See, *Open Internet Order*, ¶¶13-14.
[101] *Open Internet Order*, ¶14.
[102] *In the Matter of Preserving the Open Internet Broadband Industry Practices*, GN Docket No. 09-191, WC Docket No. 07-52 Report and Order, December 23, 2010, ¶76. ("*2010 Open Internet Order*.")

4. With paid prioritization, "supplemental revenues" are unlikely to flow back to customers

The *2017 NPRM* asks whether broadband ISPs might generate a "supplemental revenue stream" that would then allow them to offer lower-priced broadband Internet access service to end-users.[103] This is a theoretical possibility, the likelihood of which is directly related to the level of competition in residential broadband markets. As discussed elsewhere in these comments, the level of competition in residential broadband markets is not sufficient to discipline broadband ISPs.[104] Thus, it is more likely that any "new revenue streams" would be utilized by broadband ISPs to enhance profits rather than to be returned to customers.

5. Title II is needed to prevent paid prioritization

The *2017 NPRM* asks whether there are other formulations of the *ex ante* flat ban on paid prioritization.[105] Here too the Commission has the benefit of experience with its previous pursuit of enforcing open Internet principles under a Title I approach. For example, in the *2014 Open Internet NPRM,* the Commission floated the idea that Title I could be used to support the network neutrality rules if discrimination were allowed, using a "minimum level of access" approach. The *2014 Open Internet NPRM* proposed a framework in which discrimination would be permissible, if the broadband ISP maintained a "minimum level of access" for those customers that did not choose to pay the additional prices associated with fast lanes.[106] A minimum level of access was needed to prevent broadband ISPs from artificially degrading the non-fast-lane services, so as to ensure an "Internet experience that is sufficiently robust, fast, and

[103] *2017 NPRM,* ¶86.
[104] See discussion in Section VII. A.
[105] *2017 NPRM,* ¶88.
[106] *In the Matter of Protecting and Promoting the Open Internet, GN Docket No. 14-28, Notice of Proposed Rulemaking*, May 15, 2014, ¶97.

effectively usable."[107] Such a scheme is destined to fail under Title I. Judge Silberman's dissent in the *Verizon v. FCC* case illustrates why:

> "while there is a possibility that a 'fast lane' Internet service might be offered on a non-common carriage basis, the service that most users receive under this rule would still have to be offered as common carriage, at a regulated price of zero."[108]

Defining a minimum threshold of access, and requiring that the minimum be offered (or exceeded and offered) to all comers indiscriminately and on general terms is certainly in the spirit, if not the letter of, a common carrier requirement.

Judge Silberman also points to additional problems with the introduction of fast lanes, combined with a standard that required an "effectively usable" alternative be available to any edge provider who did not want the higher-cost prioritization:

> By exceeding the minimum level of service, the majority suggests, the broadband providers would have wide latitude to engage in individualized bargaining, which might take this rule outside of common carriage per se. *My concern with this hypothesis is that the phrase "effectively unusable" is subject to manipulation.* I think it should mean that whatever speed is generally offered to most edge providers is the minimum necessary to be effectively usable. *After all, it is artificial to distinguish between what is "effective" and what consumers expect. If a faster speed were to become standard, we would likely consider a slower speed to be effectively unusable. . . .*[109]

Judge Silberman's observations identify another set of problems with the *2017 NPRM's* proposal to abandon the flat ban on fast lanes. If fast lanes are introduced, some standard must be applied to the access that is available outside of a fast lane arrangement. The determination of the effective usability of a service, as noted by Judge Silberman, is an evolving concept that will affect the relative usability of services. As discussed earlier, there is clear evidence of the dynamic of effective usability.[110] Consumer expectations regarding the performance of their

[107] *2014 Open Internet NPRM*, ¶¶98-99.
[108] *Verizon v. FCC*, Silberman dissent.
[109] *Verizon v. FCC,* Silberman, Senior Circuit Judge, concurring in part and dissenting in part, p. 17.
[110] See Section III. B. 2.

online activities has shown a trend where "inferior" is defined by the speed at which applications, content, or services load into the user's device. A few seconds (or milliseconds) delay can result in a decidedly inferior experience for the consumer. Defining an acceptable level of performance for non-fast-lane services would require substantial regulatory oversight, and a Title II foundation.

C. An Internet conduct standard plays an important role

The *2015 Title II Order* included both general and specific provisions designed to promote the virtuous circle and protect Internet openness. The Internet conduct standard addressed non-specific behavior that could negatively affect the open Internet:

> Any person engaged in the provision of broadband Internet access service, insofar as such person is so engaged, shall not unreasonably interfere with or unreasonably disadvantage (i) end users' ability to select, access, and use broadband Internet access service or the lawful Internet content, applications, services, or devices of their choice, or (ii) edge providers' ability to make lawful content, applications, services, or devices available to end users. Reasonable network management shall not be considered a violation of this rule.[111]

The *2017 NPRM* proposes to eliminate this standard, with no alternative replacement.[112] AARP is opposed to this approach, and finds it to be inconsistent with the *2017 NPRM's* stated opposition to the blocking of lawful content.[113] The Internet conduct standard provides a backstop to address non-specific ISP behavior that may threaten both end users' and edge providers' ability to utilize broadband Internet access facilities without undue interference. The *2017 NPRM* indicates that the case-by-case approach associated with the Internet conduct standard poses a threat to innovation,[114] however, the *2017 NPRM's* consideration of innovation

[111] *2015 Title II Order*, ¶136.
[112] *2017 NPRM,* ¶¶73-75.
[113] *2017 NPRM,* ¶80.
[114] *2017 NPRM*, ¶74.

only extends to broadband ISPs, and does not consider the potential impact of ISP mischief on edge provider innovation.

The *2017 NPRM* also proposes, as an alternative, to possibly address "commercially unreasonable practices," or to engage in "adjudication of non-discrimination complaints."[115] While these alternatives may lend some degree of support to an open Internet, viewed in the context of the balance of the *2017 NPRM*¸ which proposes to eliminate the Title II foundation established in 2015, AARP does not believe that these proposed alternatives will provide any meaningful protection. As is discussed elsewhere in these comments, the Commission has been unable to gain any traction to enforce open Internet principles, other than the transparency rule, with a Title I foundation.

Certainly, the *2015 Title II Order's* approach can be viewed as "belt and suspenders" by combining bright line rules with the Internet conduct standard. However, the Internet conduct standard plays the important role of providing the Commission with the ability to address new or unanticipated behaviors on the part of broadband ISPs. As the *2017 NPRM* clearly illustrates, the Commission can assess ISP behavior and determine whether observed actions rise to the level of "unreasonably interfering or unreasonably disadvantaging" end users or edge providers.[116] The *2017 NPRM*'s proposal to eliminate the Internet conduct provisions would strip the Commission's ability to ensure the continuation of "the free and open Internet that Americans cherish."[117]

[115] *2017 NPRM,* ¶75.
[116] *2017 NPRM,* ¶74, discussing the "Zero Rating Report."
[117] *2017 NPRM,* ¶1.

D. The enhanced transparency rule is essential for consumer protection

The *2017 NPRM* indicates continued support for the objectives associated with both the 2010 transparency rule and its 2015 enhancement, which were based on the proposition that "effective disclosure of Internet service providers' network management practices, performance, and commercial terms of service promotes competition, innovation, investment, end-user choice, and broadband adoption."[118] The *2017 NPRM* goes on to question whether the additional reporting requirements associated with the *2015 Title II Order* remain necessary "in today's competitive broadband marketplace."[119] AARP believes that these rules continue to provide vital consumer protection. As discussed elsewhere in these comments, there is no evidence to support the proposition that broadband markets are competitive for either end users or edge providers.[120] Absent competition, the transparency rules are needed to ensure that broadband providers do not disadvantage consumers, degrade interoperability, or stifle innovation.

Regarding the "basic" transparency rules, there is no question that the Commission has authority to impose the rules—either under Title II or Title I. As noted by the D.C. Circuit:

> The disclosure rules are another matter. Verizon does not contend that these rules, on their own, constitute per se common carrier obligations, nor do we see any way in which they would. . . . Verizon does argue that the disclosure rules are not severable, insisting that if the anti-discrimination and anti-blocking rules fall so too must the disclosure requirements. We disagree. "Whether the offending portion of a regulation is severable depends upon the intent of the agency and upon whether the remainder of the regulation could function sensibly without the stricken provision."[121]

[118] *2017 NPRM,* ¶89, citing to *2015 Title II Order*, 30 FCC Rcd at 5670, ¶157; *2010 Open Internet Order*, 25 FCC Rcd at 17938–39, ¶56.
[119] *2017 NPRM,* ¶90.
[120] See Sections VII. A & B.
[121] D.C. Circuit, 2014, p. 62.

So, the Commission can be certain that the transparency rules are consistent with either classification, and these rules are still needed. As noted by Judge Silberman in his dissent in the *Verizon v. FCC* case, the Commission's ability to require disclosure is consistent with statute:

> The Commission is required to make triennial reports to Congress on "market entry barriers" in information services, 47 U.S.C. § 257, and requiring disclosure of network management practices appears to be reasonably ancillary to that duty.[122]

AARP also believes that the *2015 Title II Order's* enhancements to the 2010 transparency rules provide vital consumer protections, and are essential given the lack of competition in broadband markets, as well as the complexity of broadband offerings. Disclosures related to price, fees, and data caps and allowances provide consumers with information that is vital to their ability to evaluate service offerings.[123] Furthermore, the additional disclosure enhancements associated with performance are also important consumer protections.[124] For example, the requirement for geographic-specific information regarding performance will enable consumers to fully understand offers, which are likely to be marketed within a carrier's national advertising framework, but which may come with limitations in some areas. Geographic-specific information will also encourage broadband ISPs to engage in system-wide technology deployments, which will result in benefits that are more expansive geographically. Similarly, requiring that broadband ISPs measure network performance over a reasonable period of time and during times of peak usage will provide important information to consumers regarding the true potential of broadband service offers. By making the purchase of broadband technology transparent to consumers, there will be less customer confusion, and lower barriers to broadband adoption.

[122] Silberman dissent, footnote 9.
[123] *2015 Title II Order*, ¶164.
[124] *2015 Title II Order*, ¶166.

E. Mobile broadband Internet access service is not a "private mobile service"

Nowhere is the *2017 NPRM's* "back to the future" perspective more troubling than with its approach to mobile broadband services, which were classified as telecommunications by the *2015 Title II Order*. The NPRM proposes to reclassify mobile broadband Internet access service under Title I as a "private mobile service." AARP believes that this is inappropriate. Given the emerging 5G technology, it is possible that fixed and mobile broadband services will become part of the same integrated platform. As noted by Chaesub Lee, Director of the International Telecommunications Union's standardization unit:

> Innovation in standardization is essential across core networks, access networks, virtualized data clusters and masses of smart networked units. Moving beyond convergence, the concepts underlying networking must evolve to support the development of integrated fixed/mobile hybrid networks.[125]

Integration of fixed and mobile networks will create tremendous opportunities for new innovation at the network edge. However, this integration of fixed and mobile networks will also increase risks associated with the exercise of market power on the part of broadband ISPs—especially those broadband ISPs that currently have both large-scale wireless mobile and fixed wireline broadband networks. Unless both elements of these integrated firms' broadband networks are subject to no-blocking and nondiscrimination requirements, future innovation will be constrained on the next-generation broadband platform.

Rather than supporting that potential for innovation and investment, the *2017 NPRM* proposes to revert to classifications of mobile services that were associated with voice mobility platforms of the mid-1990s. If the FCC goes down that path, and repeals the current classification of mobility

[125] "ITU's latest specs show that 5G is not just a wireless network," *The Register*, April 27, 2017. https://www.theregister.co.uk/2017/04/27/itu_s_latest_specs_show_that_5g_is_not_just_a_wireless_network/

broadband services, the global leadership the U.S. has enjoyed with advanced Internet applications and services will be threatened.

The *2017 NPRM's* proposal to reclassify mobile broadband services as "private mobile services" is inconsistent with the design of the technology and the way that it is sold. Private mobile services, such as private taxi dispatch services, have no relation to mobile broadband Internet access services, and the public interest will not be served by this proposed reclassification. Mobile broadband providers offer their consumers the same product as fixed wireline broadband providers—bandwidth. Offers of "unlimited" data transmission indicate that nothing more than transmission capability is provided.[126] Furthermore, unlike private mobile services, this offer is both directed at, and accepted by, hundreds of millions of subscribers. These facts about mobile broadband services today fulfill the statutory definition of commercial mobile services, i.e., services which are (1) "provided for profit," and (2) make "interconnected services" available, "to the public" or to "a substantial portion of the public."[127] As summarized by the District Court in the *USTelecom v. FCC* decision, the *2015 Title II Order's* approach is entirely reasonable:

> According to the Commission, then, mobile broadband meets all parts of the statutory definition of a "commercial mobile service" subject to common carrier regulation: it is a "mobile service ... that is provided for profit and makes interconnected service available ... to the public or ... a substantial portion of the public." . . . We find the Commission's reclassification of mobile broadband as a commercial mobile service under that definition to be reasonable and supported by record evidence demonstrating the "rapidly growing and virtually universal use of mobile broadband service" today. . . . In support of its reclassification decision, the Commission relied on, and recounted in detail, evidence of the explosive growth of mobile broadband service and its near universal use by the

[126] See, for example, https://www.verizonwireless.com/plans/verizon-plan/ ; https://www.t-mobile.com/cell-phone-plans?icid=WMM_TM_Q117TMO1PL_H85BRNKTDO37510 ; https://www.sprint.com/en/shop/plans/unlimited-cell-phone-plan.html?INTNAV=TopNav:Shop:UnlimitedPlans ; https://www.att.com/plans/unlimited-data-plans.html .
[127] 47 U.S.C. §332(d)(1).

> public. . . . In the face of that evidence, we see no basis for concluding that the Commission was required in 2015 to continue classifying mobile broadband as a "private" mobile service.[128]

To achieve the reclassification of mobile broadband as a private mobile service, the *2017 NPRM*, also proposes to revert to the Commission's 1994 definition of the "public switched network."[129] The *2017 NPRM* argues that it is inappropriate to deviate from the "historical usage of the term 'public switched network.'"[130] AARP does not believe that it is reasonable to adopt a definition of the public switched network that was developed prior to the 1995 privatization of the Internet, and the Commission should not ignore the historical transformation of public telecommunications networks that has resulted from the emergence of the broadband Internet. The matter of the historical usage of the term public switched network was addressed by the District Court in the 2016 *USTelcom vs. FCC* decision:

> Mobile petitioners argue that Congress intended "public switched network" to mean — forever — "public switched telephone network," and that the Commission thus lacks authority to expand the definition of the network to include endpoints other than telephone numbers. We are unpersuaded. Mobile petitioners' interpretation necessarily contemplates adding a critical word ("telephone") that Congress left out of the statute, an unpromising avenue for an argument about the meaning of the words Congress used. . . . If Congress meant for the phrase "public switched network" to carry the more restrictive meaning attributed to it by mobile petitioners, Congress could (and presumably would) have used the more limited — and more precise — term "public switched telephone network." Indeed, Congress used that precise formulation in another, later-enacted statute. . . . Here, though, Congress elected to use the more general term "public switched network," which by its plain language can reach beyond telephone networks alone. . . .

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[128] *United States Telecom Association, et al., Petitioners v. Federal Communications Commission and United States of America, Respondents Independent Telephone & Telecommunications Alliance, et al., Intervenors United States Court of Appeals*, District of Columbia Circuit. June 14, 2016. 825 F.3d 674 716 (2016), citations omitted. Hereinafter *USTelecom v. FCC.*

[129] *2017 NPRM,* ¶56, citing to *Implementation of Sections 3(n) and 332 of the Communications Act; Regulatory Treatment of Mobile Services,* GN Docket No. 93-252, Second Report and Order, 9 FCC Rcd 1411, 1434, 1436–37, paras. 53, 59 (1994).

[130] *2017 NPRM,* ¶56.

> Not only did Congress decline to invoke the term "public switched telephone network," but it also gave the Commission express authority to define the broader term it used instead. . . . Mobile petitioners conceive of "public switched network" as a term of art referring only to a network using telephone numbers. But if that were so, it is far from clear why Congress would have invited the Commission to define the term, rather than simply setting out its ostensibly fixed meaning in the statute. We instead agree with the Commission that, in granting the Commission general definitional authority, Congress "expected the notion [of the public switched network] to evolve and therefore charged the Commission with the continuing obligation to define it."[131]

That the Commission would now reject the potential for the public switched network to evolve is troubling. Given that the *2017 NPRM* also continues to express concern regarding the potential for blocking,[132] the proposal to revert to a pre-Internet perspective on the nature of the public switched network is vexing.

Furthermore, mobile broadband Internet access is also the functional equivalent of a commercial mobile service. The logic of the *2015 Title II Order* on this matter continues to be sound:

> Under the statutory definition, commercial mobile services must be "interconnected with the public switched network (as such terms are defined by regulation by the Commission)." Consistent with that delegation of authority to define these terms, and with the Commission's previous recognition that the public switched network will grow and change over time, this Order updates the definition of public switched network to reflect current technology, by including services that use public IP addresses. Under this revised definition, the Order concludes that mobile broadband Internet access service is interconnected with the public switched network. In the alternative, the Order concludes that mobile broadband Internet access service is the functional equivalent of commercial mobile service because, like commercial mobile service, it is a widely available, for profit mobile service that offers mobile subscribers the capability to send and receive communications, including voice, on their mobile device.[133]

Given existing technologies associated with mobile broadband services, the *2015 Title II Order's* classification makes sense. In light of the potential integration of fixed and mobile networks, the

[131] *USTelecom v. FCC.* 825 F.3d 674 717-718 (2016). Citations omitted.
[132] *2017 NPRM,* ¶80.
[133] *2015 Title II Order,* ¶48, footnotes omitted.

classification makes even more sense. The *2017 NPRM's* proposal to revert to definitions associated with what amounts to ancient history regarding the nature of mobile services and the public switched network, and to impose the "private mobile network" classification has the potential to due tremendous harm to Internet innovation and investment. A "private mobile service" classification would pick the winners associated with the future integration of fixed and mobile broadband networks—incumbents that own the networks—to the detriment of competition and innovation.

F. Non-BIAS data services do not dilute the benefits of the *2015 Title II Order's* rules

The *2017 NPRM* poses questions regarding the relationship between "curated content" and the need for Title II.[134] On the matter of "curated content," the *2015 Title II Order* included an avenue for broadband ISPs to experiment with data services that were not Internet access services, and to avoid the bright line rules that were elsewhere enumerated. These "non-BIAS data services" were described as having the following characteristics:

> First, these services are not used to reach large parts of the Internet. Second, these services are not a generic platform—but rather a specific "application level" service. And third, these services use some form of network management to isolate the capacity used by these services from that used by broadband Internet access services.[135]

The *2017 NPRM* references language in the D.C. Circuit's decision affirming the *2015 Title II Order*. On the matter of non-BIAS data services, the D.C. Circuit states:

> The Order defines broadband internet access service as a "mass-market retail service" — i.e., a service that is "marketed and sold on a standardized basis" — that "provides the capability to transmit data to and receive data from all or substantially all Internet endpoints." . . . That definition, by its terms, includes only those broadband providers that hold themselves out as neutral, indiscriminate conduits. Providers that may opt to

[134] *2017 NPRM,* 79.
[135] *2015 Title II Order*, ¶209.

> exercise editorial discretion — for instance, by offering access only to a limited segment of websites specifically catered to certain content — would not offer a standardized service that can reach "substantially all" endpoints.[136]

The non-BIAS data services would enable broadband ISPs to, for example, offer a limited number of web sites, blogs, and other proprietary content to consumers as a service distinct from their broadband Internet access offering.[137]

The *2017 NPRM* discusses the D.C. Circuit's summary as follows:

> Given that an ISP can avoid Title II classification simply by blocking enough content, are the purported benefits of the existing rules more illusory than they initially appear? By disclosing to consumers that it is offering a "curated internet experience," can an ISP escape from the ambit of the rules entirely? We seek comment on the implications of the D.C. Circuit's observation.[138]

AARP does not believe that the D.C. Circuit's observations support in any way the proposition that "the more you block, the less the 2015 Title II-based rules apply." As noted by the D.C. Circuit, there are two distinct service classifications in the *2015 Title II Order*: (1) broadband Internet access that "includes only those broadband providers that hold themselves out as neutral, indiscriminate conduits," and (2) non-BIAS data services, which offer access only to a limited segment of websites specifically catered to certain content, and do not "offer a standardized service that can reach 'substantially all' endpoints." AARP does not believe that the *2017 NPRM's* observations on this matter are consistent with the D.C. Circuit's observations, as a result, the benefits of the *2015 Open Internet Order* are not illusory, and the existence of non-

[136] 825 F.3d 674 743 (2016). Citations omitted.
[137] Facebook has experimented with such an offering in less developed nations, such as India, where it met with vigorous resistance, leading it to drop its efforts in that nation. See, for example, "Facebook Loses a Battle in India Over Its Free Basics Program, *New York Times*, February 8, 2016. https://www.nytimes.com/2016/02/09/business/facebook-loses-a-battle-in-india-over-its-free-basics-program.html
[138] *2017 NPRM,* ¶79.

BIAS data services does not undermine the application of the *2015 Title II Order's* rules to broadband Internet access services.

In summary, the *2015 Title II Order* supports a set of rules that continue to be vital to the success of the Internet, and the Commission should maintain both the rules and Title II classification. Moving to a Title I framework, as the *2017 NPRM* suggests is desirable, will undermine the Commission's ability to pursue its stated goals of continuing to effectively prevent blocking of lawful content, which is essential to Internet openness.[139] Likewise, rules governing throttling and paid prioritization provide strong complements to no-blocking protections, as even subtle differences in performance caused by broadband ISPs can harm consumers, competition, and innovation. Finally, the Commission's goals of competition, innovation, investment, end-user choice, and broadband adoption will be well served by continuation of the enhanced disclosure requirements, which require effective disclosure of Internet service providers' network management practices, performance, and commercial terms of service.[140]

IV. Legal authority: Open Internet rules and Title I are a losing proposition

The *2017 NPRM* seeks comment on the legal authority the Commission would have to "adopt rules" if it classifies broadband Internet access service as an information service.[141] Given that the Commission has previously failed at this under theories of ancillary authority and Section 706,[142] AARP does not believe that revisiting these paths is a reasonable option. As will be discussed further below, other avenues are no more promising. The Commission might attempt to resurrect the discrimination and "fast lane" approach of the *2014 Open Internet NPRM*.[143]

[139] *2017 NPRM,* ¶80.
[140] *2017 NPRM,* ¶89.
[141] *2017 NPRM,* ¶100.
[142] See, respectively, *Comcast v. FCC*, 600 F. 3d 642 (2010), and *Verizon v. FCC*, 740 F.3d 623 (2014).
[143] *2014 Open Internet NPRM,* ¶97.

That approach, however, would fail precisely due to the need for minimum performance requirements, which also require common carrier principles to ensure that "reasonable" fast lanes and discrimination could be established.[144] Alternatively, Section 230 might be considered as a source of authority. However, it is doubtful whether the hortatory language of Section 230(b) is sufficient, and even if it were a delegation of authority, the provisions of that section are overly narrow, and would not provide a sufficient foundation to protect consumers and edge providers from blocking and discrimination.

A. Section 706 does not contain a "deregulatory bent"

The *2017 NPRM* also poses the question of whether Section 706 reflects a "deregulatory bent."[145] AARP believes that the plain language of Section 706 makes clear that regulation is a tool to be utilized by the Commission, both generally and specifically, and specifically charges the Commission to make use of regulatory tools to promote the deployment of advanced telecommunications.

> (a) In general
>
> The Commission and each State commission with regulatory jurisdiction over telecommunications services *shall encourage the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans* (including, in particular, elementary and secondary schools and classrooms) by utilizing, in a manner consistent with the public interest, convenience, and necessity, *price cap regulation, regulatory forbearance, measures that promote competition in the local telecommunications market, or other regulating methods that remove barriers to infrastructure investment.*
>
> (b) Inquiry
>
> The Commission shall, within 30 months after February 8, 1996, and annually thereafter, initiate a notice of inquiry concerning the availability of advanced telecommunications capability to all Americans (including, in particular, elementary and secondary schools

[144] See discussion in Section III. B. 1.
[145] *2017 NPRM,* ¶101.

> and classrooms) and shall complete the inquiry within 180 days after its initiation. In the inquiry, *the Commission shall determine whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion. If the Commission's determination is negative, it shall take immediate action to accelerate deployment of such capability by removing barriers to infrastructure investment and by promoting competition in the telecommunications market.*
>
> . . .
>
> (1) Advanced telecommunications capability
>
> The term "advanced telecommunications capability" is defined, without regard to any transmission media or technology, as high-speed, switched, broadband telecommunications capability that enables users to originate and receive high-quality voice, data, graphics, and video telecommunications using any technology.[146]

Section 706 begins with the "shall encourage" statement. This indicates that the Commission is required to encourage the deployment of advanced telecommunications services to *all* Americans.[147] These advanced services are identified for the Commission as "high-speed, switched, broadband telecommunications capability that enables users to originate and receive high-quality voice, data, graphics, and video telecommunications using any technology." Certainly, broadband Internet access services do just what the statute describes. To achieve the stated objective, the statute goes on to specify, in the same "shall encourage" sentence, regulatory methods that the Commission can employ—price cap regulation, regulatory forbearance, measures to promote competition, and *other regulating methods* that remove barriers to infrastructure investment. These general and specific measures contained in the statute cannot be seen as a "deregulatory bent"—they instead describe a legislative mandate for regulation and identify a regulatory toolbox.

[146] Section 706, as codified at 47 U.S. Code § 1302 - Advanced telecommunications incentives. Emphasis added.
[147] According to the legislative drafting rules of the U.S. House of Representatives: The term "shall" means that an action is required; the term "may" means that it is permitted but not required.
https://legcounsel.house.gov/HOLC/Drafting_Legislation/Drafting_Guide.html#VIIB

Section 706 then goes on to require the Commission to make a determination as to whether advanced telecommunications is being deployed ("shall…initiate a notice of inquiry"). If the Commission finds, as a result of the inquiry, that advanced telecommunications capability is not being deployed, the statute indicates the Commission *shall* take immediate regulatory action to remove entry barriers and promote competition. This language is entirely consistent with the broad regulatory mission of the 1996 Act, which focused on the promotion of competition through regulatory means.

The *2017 NPRM* also asks what would happen to any rules adopted using Section 706 authority "if the Commission later found that advanced telecommunications was being deployed to all Americans in a reasonable and timely fashion?"[148] AARP believes that one affirmative finding on this matter does not dissolve the statutory requirements. Advanced telecommunications capability is a dynamic concept, and the statute specifies that advanced telecommunications must be capable of delivering "high-quality voice, data, graphics, and video telecommunications using any technology." What was "high-quality" at a time when copper-based ADSL was the state of the art in residential broadband is not likely to be considered high-quality when fiber optics is the state-of-the-art. Thus, technological change and the dynamic evaluation of the statutory provisions suggests that changes to the rules adopted under Section 706 authority would not be necessary.

B. Section 706 is not hortatory and reflects a delegation of authority

In its discussion of other sources of authority, the *2017 NPRM* also poses the question of whether Sections 706(a) and (b) of the 1996 Act are simply hortatory, as opposed to delegations of

[148] *2017 NPRM*, ¶101.

regulatory authority.[149] This matter was discussed at length by the D.C. Circuit the *Verizon* decision:

> As Verizon argues, this language [Section 706(a)] could certainly be read as simply setting forth a statement of congressional policy, directing the Commission to employ "regulating methods" already at the Commission's disposal in order to achieve the stated goal of promoting "advanced telecommunications" technology. But the language can just as easily be read to vest the Commission with actual authority to utilize such "regulating methods" to meet this stated goal. As the Commission put it in the *Open Internet Order*, one might reasonably think that Congress, in directing the Commission to undertake certain acts, "necessarily invested the Commission with the statutory authority to carry out those acts."[150]

With regard to Section 706(b), the D.C. Circuit concluded:

> We think it quite reasonable to believe that Congress contemplated that the Commission would regulate this industry, as the agency had in the past, and the scope of any authority granted to it by section 706(b) — limited, as it is, both by the boundaries of the Commission's subject matter jurisdiction and the requirement that any regulation be tailored to the specific statutory goal of accelerating broadband deployment — is not so broad that we might hesitate to think that Congress could have intended such a delegation.[151]

This discussion, as well as the language in Section 706 itself, make it clear that a delegation of authority is consistent with the section.

C. Section 230(b) is not sufficient to support the virtuous circle or open Internet rules

As a non-Title II mechanism to support network neutrality rules, the *2017 NPRM* points to language contained in Section 230, that the policy of the United States is to "to preserve the vibrant and competitive free market that presently exists for the Internet and other interactive computer services, unfettered by Federal or State regulation."[152] The *2017 NPRM* also points to

[149] *2017 NPRM,* ¶101.
[150] Verizon v. F.C.C. 740 F.3d 623 637-638 (2014).
[151] *Verizon v. F.C.C.* 740 F.3d 623 641 (2014).
[152] *2017 NPRM,* ¶34, citing 47 U.S.C. §230(b)(1).

language in the D.C. Circuit's *2010 Comcast Order* that suggested that the Commission might attempt to establish a delegation of Title I statutory authority through Section 230(b).[153] AARP believes that the Commission would face significant challenges in trying to make the needed connection, and that Section 230 is hortatory and does not delegate the required authority to protect Internet users and edge providers. As noted by the D.C. Circuit in the *Verizon v. FCC* ruling "the Supreme Court (has) relied on policy statements not because, standing alone, they set out 'statutorily mandated responsibilities,' but rather because they did so in conjunction with an express delegation of authority to the Commission. . ."[154] With no delegation of authority, Section 230 does not appear promising. However, despite these limitations, and considering the *2017 NPRM's* request, AARP will take a fresh look at Section 230(b).

Section 230(b) reads:

> (b) **Policy** It is the policy of the United States—
>
> > (1) to promote the continued development of the Internet and other interactive computer services and other interactive media;
> >
> > (2) to preserve the vibrant and competitive free market that presently exists for the Internet and other interactive computer services, unfettered by Federal or State regulation;
> >
> > (3) to encourage the development of technologies which maximize user control over what information is received by individuals, families, and schools who use the Internet and other interactive computer services;
> >
> > (4) to remove disincentives for the development and utilization of blocking and filtering technologies that empower parents to restrict their children's access to objectionable or inappropriate online material; and
> >
> > (5) to ensure vigorous enforcement of Federal criminal laws to deter and punish trafficking in obscenity, stalking, and harassment by means of computer.

[153] *2017 NPRM,* ¶102, citing *Comcast v. FCC*, 600 F.3d at 654.
[154] *Comcast v. F.C.C.* 600 F.3d 642 652 (2010)

Section 230(b) certainly looks like a policy statement—it is not an operative part of the statute, and does not enlarge or confer powers on the Commission. As such, the section fails to set forth "statutorily mandated responsibilities." As noted by the D.C. Circuit, he Commission has previously concluded this about Section 230(b).[155]

To explore the issue further, consider the "no blocking" rule, the type of rule that the *2017 NPRM* appears to indicate is desirable.[156] The current rule states:

> A person engaged in the provision of broadband Internet access service, insofar as such person is so engaged, shall not block lawful content, applications, services, or nonharmful devices, subject to reasonable network management.

Sections 230(b)(1) & (2), given their hortatory nature, do not appear to lend specific support to the existing blocking rule. On the other hand, Sections 230(b)(4) & (5) address the issue of parental controls and the prevention of nefarious actions in cyberspace, also unsupportive of the no-blocking rule. However, the 230(b)(3) language regarding the maximization "user control over what information is received by individuals, families, and schools who use the Internet and other interactive computer services" might be construed to lend some support to some sort of no-blocking rule, as it appears to suggest that end-users should be in control of the content that they receive. However, a closer look at Section 230(b)(3) reveals significant problems with its ability to promote either no-blocking or Internet openness.

First, Section 230(b)(3) only addresses user control of information that is *received*. It does not address user control of information that is *sent*, and as discussed elsewhere in these comments, the ability of end-users to send information through uploading has become as important as receiving information through downloading—end-users now seamlessly slip between the role of

[155] *Comcast v. FCC*, 600 F.3d at 652.
[156] *2017 NPRM,* ¶80.

consumer and producer of Internet content and services.[157] Thus, to the extent that Section 230(b)(3) could protect end users from ISP blocking, it appears only to protect the "download" portion of the end user's broadband Internet access experience.

Second, it is doubtful that Section 230(b)(3) provides any traction to control the behavior of broadband ISPs associated with third-party edge providers. Section 230(b)(3) only encourages the development of technologies that "maximize user control of what information is received," there is nothing in the section directed at preventing broadband ISPs from taking actions that discriminate against edge providers. If broadband ISPs discriminate against the edge, they will implicitly limit the scope of information available to consumers. As a result, a consumer who specified that they wanted "access to all information" might be facing an already-restricted set of information choices, due, for example, to broadband ISPs imposing "fast lane" requirements on edge providers, or otherwise degrading edge provider access—actions which would also disrupt the "virtuous circle" and result in a restricted network edge. Section 230(b)(3) does not protect the entire "virtuous circle, and would thus also harm consumers as edge innovation and investment would be harmed if discriminatory practices emerged. A less valuable edge would then also diminish demand for high-quality broadband. *To ensure that the virtuous circle continues, the Commission needs authority to protect both edge providers and end users*, and Section 230(b)(3) does not extend the needed protection to edge providers.

Furthermore, Section 230(b)(3) only addresses user control of *information.* Even if Section 230(b)(3) could be interpreted as providing authority to control broadband ISP behavior with regard to *information*, it is less clear as to the potential to stop blocking of applications and/or

[157] See Section VII. C. 5.

services that consumers might request. Because Section 230(b)(3) is silent on applications and services, there appears to be no foundation for a no-blocking rule extending to these vital components of consumers' Internet usage.

In conclusion on Section 230(b)(3), AARP does not believe that the linking of the "maximize user control of what information is received" element of Section 230(b)(3) protects both end users and the network edge, so as to promote a virtuous circle of investment and innovation. Furthermore, the District Court was quite clear in the *Verizon* ruling that the virtuous circle was supported well by Section 706, and Section 706 needed Title II. In the *Verizon* ruling the District Court made no reference to Section 230 as providing a potential alternative or superior solution. In the previous *Comcast v. FCC* case, in which the Section 230 issue was discussed by the District Court, Section 230 was linked to the Commission's attempt to impose no-blocking requirements using the ancillary authority approach. The District Court had not yet been introduced to the virtuous circle argument. AARP believes that Section 230 does not have the ability to protect Internet openness, or to establish a meaningful no-blocking authority.

D. The First Amendment does not bar *Open Internet* rules

The *2017 NPRM* notes that the D.C. Circuit disagreed with the First Amendment challenge to the FCC's authority, leaving the *2015 Title II Order's* rules intact.[158] Thus, AARP views this matter as settled. However, the *2017 NPRM* also raises an argument advanced by "at least one judge on the D.C. Circuit" who apparently believes that "the First Amendment bars the Government from restricting the editorial discretion of Internet service providers, absent a showing that an Internet service provider possesses market power in a relevant geographic market."[159] AARP has

[158] *2017 NPRM,* ¶104.
[159] *2017 NPRM,* ¶104.

reviewed Judge Kavanaugh's dissent from the en banc cited in support of the *2017 NPRM's* proposition that First Amendment concerns may still be afoot, and AARP does not find the en banc dissent argument to be convincing (or even on point). The section of the en banc dissent cited in the *2017 NPRM* states:

> But absent a demonstration of a company's market power in the relevant geographic market, the Government may not interfere with a cable operator's or an Internet service provider's First Amendment right to exercise editorial discretion over the content it carries. See *Comcast Cable Communications, LLC v. FCC*, 717 F.3d 982, 993 (D.C. Cir. 2013) (Kavanaugh, J., concurring); *Cablevision Systems Corp. v. FCC*, 597 F.3d 1306, 1323 (D.C. Cir. 2010) (Kavanaugh, J., dissenting).[160]

Judge Kavanaugh's interpretation is thus based on case law associated with the obligations of multichannel video distribution companies to carry programming under Section 616 of the Communications Act. Judge Kavanaugh then makes the leap that these restrictions also apply to broadband Internet access. The portion of *Comcast Cable Communications, LLC v. FCC* cited by Judge Kavanaugh to support his market power argument states:

> To the extent there is uncertainty about whether the phrase "unreasonably restrain" in Section 616 means that the statute applies only in cases of market power or instead may have a broader reach, we must construe the statute to avoid "serious constitutional concerns." . . . That canon strongly supports limiting Section 616 to cases of market power. Applying Section 616 to a video programming distributor that lacks market power would raise serious First Amendment questions under the Supreme Court's case law. Indeed, applying Section 616 to a video programming distributor that lacks market power would violate the First Amendment as it has been interpreted by the Supreme Court.[161]

Similarly, the cited portion of the *Cablevision Systems v. FCC* decision also focuses on multichannel video distribution, market power, and First Amendment concerns. AARP does not dispute that the case law associated with Section 616 suggests that market power is a prerequisite

[160] *USTelecom*, 825 F.3d 674, *reh'g en banc denied*, No. 15-1063, 2017 WL 1541517, at *31 (D.C. Cir. May 1, 2017) (Kavanaugh, J., dissenting from the denial of rehearing en banc).
[161] 717 F.3d 982 993 (2013), citations omitted.

for avoiding First Amendment conflicts for multichannel video distributors. However, the Commission's *Open Internet* rules are not directed at multichannel video distributors' carriage of video programming. As such, the arguments raised by the dissenting Judge in the en banc are not on point. Judge Kavanaugh's approach inappropriately concludes that "cable operators and Internet service providers" are the same thing. They are not. As services, broadband Internet access and multichannel video programing are distinct, as are the governing statutory provisions, Commission rules, and associated case law.

E. Summary: The *2017 NPRM's* regulatory framework will not deliver Internet freedom

The Commission wrestled with the ability to enforce its "four Internet freedoms" for 10 years. Along the way, it found that there was not a lawful solution under Title I of the Communications Act. The *2017 NPRM's* efforts to find an alternative mechanism under Title I are not promising, and alternative bases of authority, such as Title I plus Section 230(b) do not have the potential to deliver the *2017 NPRM's* stated goal of preventing the blocking of lawful material.[162] As noted by the D.C. Circuit in the *Verizon* ruling, absent a common carrier foundation, the Commission cannot hope to prevent blocking and discrimination:

> Given that the Commission has chosen to classify broadband providers in a manner that exempts them from treatment as common carriers, the Communications Act expressly prohibits the Commission from nonetheless regulating them as such. Because the Commission has failed to establish that the anti-discrimination and anti-blocking rules do not impose per se common carrier obligations, we vacate those portions of the *Open Internet Order*.[163]

AARP believes that no-blocking rules cannot be enforced without Title II.

[162] *2017 NPRM,* ¶80.
[163] *Verizon v. FCC,* 740 F.3d 623 (2014).

V. The *2017 NPRM* relies on faulty sources on broadband investment

The *2017 NPRM* asserts that since the *2015 Title II Order*, broadband investment has been depressed.[164] As will be discussed below, quantifying the precise impact of the *2015 Title II Order* on broadband investment is challenging, given the short-time period since reclassification, and the need for data to account for the many factors, other than regulation, that influence investment decisions. As part of the basis for the claim that investment would be harmed, the *2017 NPRM* indicates that broadband ISPs have previously told the Commission (as it built the record to support the *2015 Title II Order*) that Title II classification would depress investment.[165] These broadband ISP statements should be taken with a large grain of salt, as other statements made by executives of broadband ISPs, both before and after the *2015 Title II Order,* indicate that investment incentives are not harmed by Title II, and that operations would continue unaffected. As will be discussed below, the public statements and actions of broadband ISPs are not consistent with the "depressed investment" story that they told the Commission in comments in the 2014/2015 time frame.

To further support the assertion that investment has declined since the issuance of the *2015 Title II Order*, the *2017 NPRM* references sources such as a blog post by Hal Singer, a Phoenix Center white paper by George Ford, and a USTelecom report by Patrick Brogan.[166] As will be discussed further below in detail, these sources do not lend support in any way to the assertion that broadband or telecommunications investment has declined. Before turning to the specifics of these studies, a few comments on the appropriate approach to an evaluation of investment from a public policy perspective are in order.

[164] *2017 NPRM,* ¶44.
[165] *2017 NPRM,* ¶45.
[166] *2017 NPRM*, ¶45.

A. Public policy assessment of investment must assess the network edge as well as broadband providers

The *2017 NPRM* does not approach the investment issue from a reasonable public policy perspective. Specifically, the *2017 NPRM* focuses only on the purported impact of the *2015 Title II Order* on broadband investment by ISPs in isolation—the *2017 NPRM* does not consider the impact of network neutrality on investment at the network edge, for either major edge providers that produce Internet applications, content, or services, or by end-users to enable their smaller-scale production of Internet content. The *2017 NPRM's* overly narrow focus ignores any impact of the Commission's network neutrality framework on investment by entities other than broadband ISPs. As the Commission has previously recognized, the value of the Internet to a consumer is not the broadband connection alone, but is instead driven by the content and services that are available at the network edge. The Commission has previously (and correctly) recognized that there is a "virtuous circle" between investment at the network edge and investment in broadband Internet access facilities.

> Startups and small businesses benefit because the Internet's openness enables anyone connected to the network to reach and do business with anyone else, allowing even the smallest and most remotely located businesses to access national and global markets, and contribute to the economy through e-commerce and online advertising. Because Internet openness enables widespread innovation and allows all end users and edge providers (rather than just the significantly smaller number of broadband providers) to create and determine the success or failure of content, applications, services, and devices, it maximizes commercial and non-commercial innovations that address key national challenges— including improvements in health care, education, and energy efficiency that benefit our economy and civic life.
>
> *The Internet's openness is critical to these outcomes, because it enables a virtuous circle of innovation in which new uses of the network—including new content, applications, services, and devices—lead to increased end-user demand for broadband, which drives network improvements, which in turn lead to further innovative network uses. . . .* Continued operation of this virtuous circle, however, depends upon low barriers to innovation and entry by edge providers, which drive end-user demand. Restricting edge providers' ability to reach end users, and limiting end users' ability to choose which edge

> providers to patronize, would reduce the rate of innovation at the edge and, in turn, the likely rate of improvements to network infrastructure. Similarly, restricting the ability of broadband providers to put the network to innovative uses may reduce the rate of improvements to network infrastructure.[167]

The importance of the Commission's previous perspective on the "virtuous circle" cannot be overstated—it appropriately captures a broad public policy perspective. Unfortunately, the critical concept of the "virtuous circle" is absent from the *2017 NPRM.*[168] AARP believes that the absence of this broad public policy perspective is a fundamental flaw in the *2017 NPRM's* approach in general, but is especially detrimental to the evaluation of investment. It is important to note that the D.C. Circuit found the virtuous circle argument to be compelling, and noted that when considering the investment impact of *2010 Open Internet* rules, more than the impact on broadband providers is appropriately considered. Responding to arguments advanced by Verizon that broadband investment will be stifled, the D.C. Circuit stated:

> Verizon believes that any stimulus to edge-provider innovation, as well as any consequent demand for broadband infrastructure, produced by the *Open Internet Order* will be outweighed by the diminished incentives for broadband infrastructure investment caused by the new limitations on business models broadband providers may employ to reap a return on their investment. . . .
>
> The record, however, also contains much evidence supporting the Commission's conclusion that, "[b]y comparison to the benefits of [its] prophylactic measures, the costs associated with the open Internet rules . . . are likely small.". . . Here the Commission reached its "policy conclusion" by emphasizing, among other things, (1) the absence of evidence that similar restrictions of broadband providers had discouraged infrastructure investment, and (2) the strength of the effect on broadband investment that it anticipated from edge-provider innovation, which would benefit both from the preservation of the "virtuous circle of innovation" created by the Internet's openness and the increased certainty in that openness engendered by the Commission's rules. . . . In so doing, the

[167] *In the Matter of Preserving the Open Internet, Broadband Industry Practices*, GN Docket No. 09-191, WC Docket No. 07-52, Report and Order, December 23, 2010, ¶¶13-14, citations omitted, emphasis added.
[168] The *2017 NPRM* makes only one reference to the "virtuous circle" theory, where it questions whether broadband ISPs can in fact impose any harms on consumers. *2017 NPRM,* ¶50.

> Commission has offered "a rational connection between the facts found and the choice made,". . . and Verizon has given us no persuasive reason to question that judgment.[169]

Thus, when considering the *2017 NPRM's* questions regarding "investment," the Commission must look at investment in all sectors that could be affected by changing the regulatory framework.

B. The investment evidence cited by the *2017 NPRM* is incomplete and misleading

The *2017 NPRM* cites evidence that is flawed on multiple counts. None of the evidence cited by the *2017 NPRM* provides a broad perspective on investment. Rather, in each case, only broadband ISP investment is the focus of the cited study. Beyond that weakness, the three studies upon which the *2017 NPRM* rests its investment claims are rife with questionable assumptions and methodology.

1. The Singer blog post is deeply flawed

The Singer blog post,[170] which is the most frequently cited source upon which the *2017 NPRM* relies,[171] focuses only on broadband ISP investment, and makes no effort to evaluate investment by other entities, such as edge providers, or producers of equipment utilized by consumers and business when they buy broadband. As noted in the *2017 NPRM*, the Singer blog post indicates that broadband investment has declined, and that the culprit is the FCC's *2015 Title II Order*.[172] However, the study supporting the Singer blog post is anything but convincing. The most egregious error in the Singer blog post is that it overlooks the basic "Econ 101" fact that investment decisions are driven by a variety of factors other than the regulatory environment. Other problems associated with the Singer analysis include its reliance on an unacceptably short

[169] *Verizon v. FCC*, 740 F.3d 623, 649 (D.C. Cir. 2014), internal citations omitted.
[170] "Tracing AT&T's Capital Expenditures Over Time," https://haljsinger.wordpress.com/2017/02/10/tracing-atts-capital-expenditure-over-time
[171] *2017 NPRM*, ¶¶46, 110, and Statement of Chairman Ajit Pai, footnote 4.
[172] *2017 NPRM,* ¶45.

time series (one full year of Title II!) to draw its conclusions, and the Singer blog post also excludes any adjustment to the analysis associated with the fact that the largest broadband ISP in the study, AT&T, completed a major investment program in 2014.

2. Singer ignores the multiple factors that influence broadband investment

Capital expenditures are driven by a variety of factors, and this basic point is absolutely lost on the author of the Singer blog post. Regulatory changes are one potential factor, but there are a multitude of other factors that may influence investment decisions. For example, the "lumpiness" of telecommunications investment can affect the level of capital expenditures. Once the investment project is completed, the investment in the years immediately following the period of intensive investment might decline. This is exactly the case for AT&T, the largest firm in Singer's broadband ISP analysis. AT&T's Project "Velocity IP" committed $14 billion to expand both wireless and wireline networks,[173] and that program was completed in 2014. As noted by AT&T CEO Randall L. Stephenson during an investor conference call in December of 2015, capital expenditures were declining due to the wrap-up of a major investment project:

> Yes, so CapEx I have been saying for the last year and a half with kind of preconditioning people that there is – I use the term downward bias on our capital spending. And there's a downward bias for a lot of reasons, *mainly '14 was like the monster of all years. We finished off our VIP project, so the LTE deployment largely wrapped up in '14, our broadband expansion that we went down to probably 57 million IP broadband homes and finished that in '14. All of that stuff tailed off in '14 and so our CapEx has come down rather dramatically*.[174]

[173] "AT&T to Invest $14 Billion to Significantly Expand Wireless and Wireline Broadband Networks, Support Future IP Data Growth and New Services; Improved Capital Structure is Foundation for Investment and Accelerated Growth," AT&T press release, November 07, 2012. https://www.att.com/gen/press-room?pid=23506&cdvn=news&newsarticleid=35661

[174] "AT&T's (T) CEO Randall Stephenson Presentation at the UBS Global Media and Communications Brokers Conference," December 8, 2015. *Seeking Alpha,* https://seekingalpha.com/article/3741746-ts-t-ceo-randall-stephenson-presents-ubs-global-media-communications-brokers-conference

As AT&T's CEO explains, the culmination of such a huge project in 2014 led to a decline in capital expenditures in the following years. In the context of the Singer blog post, this fact is ignored, and because AT&T has the characteristics of the proverbial "800-pound gorilla" in Singer's data set, the impact of its year-to-year investment decisions will weigh heavily on his results. But failure to recognize investment anomalies related to lumpy investment deployments is not the only factor that the Singer blog post ignores.

Investment decisions are also affected by technological change. For example, the telecommunications industry is currently undergoing a networking transformation associated with the adoption of software defined networks (SDN), which have the potential to dramatically improve efficiency and to reduce investment in expensive telecommunications hardware. As noted by Cisco:

> Software-Defined Networking (SDN) helps organizations accelerate application deployment and delivery, dramatically reducing IT costs through policy-enabled work-flow automation. SDN technology enables cloud architectures by providing automated, on-demand application delivery and mobility at scale. SDN enhances the benefits of data center virtualization, increasing resource flexibility and utilization and reducing infrastructure costs and overhead.[175]

AT&T stands out among service providers in its efforts to migrate to SDN technology, with a program underway to migrate 75% of its network to SDN by 2020.[176] According to AT&T's CEO, starting at year-end 2015, this technology migration would have an impact on future capital spending by the company:

> Now, going forward, Software-Defined Networking, this is not an inconsequential impact on capital requirements. It is a rather significant effect on our capital spend. *So there's*

[175] http://www.cisco.com/c/en/us/solutions/software-defined-networking/overview.html
[176] "Inside AT&T's grand plans for SDN: Frame relay and ATM go away as the company virtualizes more functions. A Q&A with the man driving the transformation." *Network World*, January 8, 2015. http://www.networkworld.com/article/2866439/sdn/inside-atts-grand-plans-for-sdn.html

> *going to be a continual downward pressure on our capital spending just by virtue of SDN virtualizing the core network.* Thing about the cloud moves out in the datacenter into the core network, so all the economics that we have experienced in the datacenter by cloud computing is moving into the big iron core network of AT&T. *That's consequential. That's significant. And we're experiencing those effects right now*.[177]

But SDN is not the end of the story regarding the impact of technological change on AT&T's capital expenditures. Technological evolution in the broadband wireless segment of AT&T's business is also driving AT&T's capital expenditures down:

> Also, LTE; we're now at the place where the LTE conversion is done and so we're adding capacity. *LTE capacity runs about 30% to 40% cheaper than traditional UMTS capacity, downward bias on capital requirements*. Rather than laying up T1s, DS1s and so forth, we're laying up Ethernet. The capital requirements of Ethernet versus a T1, about 40% lower, okay. *And I can just keep going on and on but everything about this industry we're actually starting to get on Moore's Law in this big iron telecom business. We're not quite on Moore's Law but we're experiencing some of Moore's Law in the big iron, and this is a really exciting deal*.[178]

Technological advancements that approach Moore's Law in network infrastructure is truly exciting, as it indicates that the costs of delivering high-quality broadband to consumers has the potential to decline year-over-year.[179] These dramatic technological changes, and their impact on industry investment levels, are ignored in the Singer blog post.

Furthermore, AT&T is experiencing technological advances with wireline deployments which have a similar impact, i.e., driving down capital expenditures:

> Now move into fiber deployment. We're going to deploy more fiber next year than we did this year but the capital requirements are going down. It continues to get cheaper to

[177] "AT&T's (T) CEO Randall Stephenson Presentation at the UBS Global Media and Communications Brokers Conference," December 8, 2015. *Seeking Alpha,* emphasis added. https://seekingalpha.com/article/3741746-ts-t-ceo-randall-stephenson-presents-ubs-global-media-communications-brokers-conference
[178] "AT&T's (T) CEO Randall Stephenson Presentation at the UBS Global Media and Communications Brokers Conference," December 8, 2015. *Seeking Alpha,* emphasis added. https://seekingalpha.com/article/3741746-ts-t-ceo-randall-stephenson-presents-ubs-global-media-communications-brokers-conference
[179] If competition were present in broadband markets, which it is not, then high-quality broadband could become an affordable commodity.

> deploy fiber, pre-spliced [ph] fiber and so forth. It's all getting cheaper now. . . . Our capital requirements are getting more and more efficient all the time.[180]

AT&T is the "800-pound gorilla" in Singer's data—AT&T's capital expenditures are equivalent to 42.7 percent of the balance of the industry data used in the Singer blog post—and the size of AT&T has a necessary distorting impact on Singer's overall industry study. The data utilized to support the Singer blog post captures the investment declines associated with preexisting trends in AT&T's capital expenditures, but the Singer blog post says it all results from Title II. Furthermore, the same technological advantages identified by AT&T are available to all broadband ISPs, thus, there is downward pressure across the board in the Singer data. The overly simplistic approach used in the Singer blog post is not credible, and does not lend one iota of support to the proposition that the *2015 Title II Order* has had any negative impact on broadband capital expenditures.

3. The "Ford Counterfactual" offers no supportable conclusions on Title II and investment

The *2017 NPRM* also references the *Ford Counterfactual* white paper,[181] which purports to show that the mere threat of Title II reclassification of broadband Internet access resulted in a reduction in telecommunications investment of $160 to $200 billion between 2011 and 2015.[182] As summarized below, and as discussed in detail in the Appendix, because of faulty methodology and questionable assumptions, the *Ford Counterfactual* paper does not offer any

[180] "AT&T's (T) CEO Randall Stephenson Presentation at the UBS Global Media and Communications Brokers Conference," December 8, 2015. *Seeking Alpha,* emphasis added. https://seekingalpha.com/article/3741746-ts-t-ceo-randall-stephenson-presents-ubs-global-media-communications-brokers-conference

[181] *2017 NPRM*,¶45, referencing "Net Neutrality, Reclassification and Investment: A Counterfactual Analysis," Dr. George S. Ford, April 25, 2017. http://www.phoenix-center.org/perspectives/Perspective17-02Final.pdf (Hereinafter, *Ford Counterfactual*).

[182] *Ford Counterfactual,* p. 6. As will be discussed below and in the Appendix, the *Ford Counterfactual* does not study investment in broadband, but is a conglomeration of broadcasting and telecommunications firms.

useful information regarding the impact of the 2015 Title II reclassification (or the threat of Title II reclassification) on investment in broadband Internet access networks.

4. The *Ford Counterfactual* rebuts the Singer blog post

Before turning to the problems with the *Ford Counterfactual*, it important to note that the *Ford Counterfactual* contains information that undermines the conclusions contained in the Singer blog post. While the Singer blog post asserts that observed changes in capital expenditures since 2015 are explained by the *2015 Title II Order's* reclassification of broadband Internet access as a Title II service, the *Ford Counterfactual* paper dismisses any such connection: "Whether capital expenditures rise or fall says nothing about the investment effect of a regulatory intervention. Capital expenditures are determined by many factors, of which regulation is only one."[183] As discussed above, Singer's analysis fails on this fundamental point. Furthermore, and again in contradiction of the Singer blog post's claims regarding broadband investment, the *Ford Counterfactual* states "investment decisions occur with a delay of a two-or-so years."[184] Given that the Singer blog post draws its conclusions from one full year's worth of post Title II data, the likelihood that the data contains any information on the impact of Title II is slim. On these two points, AARP agrees with Dr. Ford. However, that agreement is short-lived as the *Ford Counterfactual* paper approaches the issue of broadband investment using incorrectly specified data, and an analysis based on inconsistent assumptions. As a result, AARP believes that the *2017 NPRM* is in error to use the *Ford Counterfactual* to draw conclusions regarding the impact of the *2015 Title II Order* on investment.[185]

[183] *Ford Counterfactual*, p. 2.
[184] *Ford Counterfactual,* p. 5.
[185] "We believe that these reduced expenditures are a direct and unavoidable result of Title II reclassification, and exercise our predictive judgment that reversing the Title II classification and restoring broadband Internet access service to a Title I service will increase investment." *2017 NPRM,* ¶46.

5. Specific problems with the *Ford Counterfactual* paper

It is first important to note that the *Ford Counterfactual* paper does not attempt to draw conclusions regarding the impact of Title II reclassification arising from the *2015 Title II Order* on broadband investment. Instead, the *Ford Counterfactual* focuses its analysis on investment during the period 2011-2015. It is the premise of the *Ford Counterfactual* that statements made in 2010 by FCC Chairman Julius Genachowski regarding potential Title II reclassification led to declining telecommunications investment during the 2011-2015 period, a period in which broadband Internet access remained under Title I.[186] So, the *Ford Counterfactual* paper is not about the impact of the *2015 Title II Order*, but of what happened between 2011 and 2015, based on the purported reaction of "telecommunications" firms to the prospect that Title II might be pursued. The *Ford Counterfactual* conducts an analysis that studies investment during a "pre-treatment" period (1980-2009) and compares that to the "treatment" period 2011-2015 (with the "treatment" being the "threat" of Title II regulation). However, even within this context, the *Ford Counterfactual* paper is plagued by faulty methodology and assumptions. The substantial problems with the *Ford Counterfactual* are discussed in detail in the Appendix. In summary:

- The *Ford Counterfactual* does not study the impact of the *2015 Title II Order*. Rather, the *Ford Counterfactual* studies the alleged impact of the "threat" of Title II, in the form of a 2010 statement by Julius Genachowski that the FCC might consider reclassification, on investment during the years 2011-2015.

- The *Ford Counterfactual* does not focus on broadband investment. Instead, the *Ford Counterfactual* studies investment in the "Broadcasting and Telecommunications" industry. This broad sector includes firms and investments that are unrelated to broadband telecommunications.

- Another glaring error is that the *Ford Counterfactual* ignores the fact that telephone companies were governed under Title II during most of the paper's "pre-treatment" period (i.e., during the years 1980-2005). Because the pre-

[186] *Ford Counterfactual*, p. 2.

treatment period had Title II regulation in place, the investment trends observed during the years 1980-2005 reflect the full impact of Title II, not the impact of Title I that the paper claims.

- Contrary to Ford's claims regarding the alleged detrimental impact of the "threat" of Title II, the investment trends shown in the *Ford Counterfactual* indicate that regulatory classification had little impact on investment during his study period. Telecommunications investment trends reported by Ford match those in his control group both during the Title II period contained in his study period (1980-2005) and following the 2005 reclassification of telephone company broadband as an information service, during the years 2005-2010. This suggests that regulatory classification has had little impact on investment decisions.

- Finally, the *Ford Counterfactual* utilizes a questionable proxy group of industries to support its "counterfactual" analysis.

All of the flaws listed above, and further discussed in detail in the Appendix, make the *Ford Counterfactual* paper an unreliable source on the impact of the *2015 Title II Order* on investment. Like the Singer blog post, the Commission can draw no conclusions from the *Ford Counterfactual*.

6. The USTelecom research brief's "guilt by association" approach is flawed

On the issue of investment, the *2017 NPRM* also states that "other countries' experiences should caution the United States that ongoing utility-style regulation should be expected to have even more dramatic impacts on investment beyond what has already occurred."[187] The *2017 NPRM* references a USTelecom research brief in support—*USTelecom US/EU Divide Brief*.[188] However, the *USTelecom US/EU Divide Brief* shows no such relationship.

[187] *2017 NPRM*, ¶45.
[188] Patrick Brogan, USTelecom, "Utility Regulation and Broadband Network Investment: The EU and US Divide," Research Brief (Apr. 25, 2017). Hereinafter *USTelecom US/EU Divide Brief*. https://www.ustelecom.org/sites/default/files/documents/Utility%20Regulation%20and%20Broadband%20Investment.pdf

The *USTelecom US/EU Divide Brief* states:

> If America's broadband internet services continue to be regulated by the federal government under a Title II regime, U.S. broadband investment per capita could decline toward much lower European levels over time. U.S. broadband investment could decline as much as 50% if it fell to European levels, a reduction in infrastructure investment of roughly $44 billion dollars yearly, according to our analysis of OECD data below.[189]

As will be discussed in more detail below, the *USTelecom US/EU Divide Brief* does not reasonably support this statement, and the Commission should not rely on conclusions regarding the impact of Title II that USTelecom advances. In fact, as will be discussed below, other USTelecom data that is cited in the research brief shows that the highest level of telephone company capital expenditures occurred during the period when telephone company broadband was regulated under Title II.

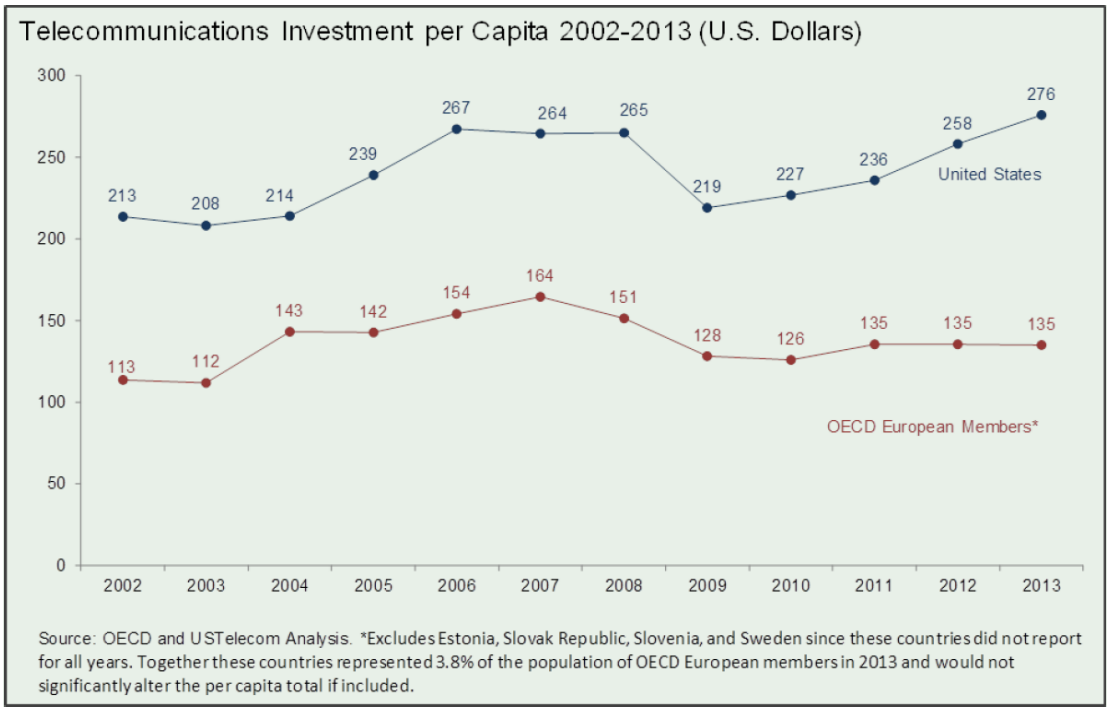

Figure 5: US Telecom research brief data on U.S. vs. EU investment

[189] *USTelecom US/EU Divide Brief*, summary on cover page.

The core of the analysis reported in the *USTelecom US/EU Divide Brief* is a comparison of "telecommunications investment per capita" for the years 2002-2013. Figure 5 reproduces the *USTelecom US/EU Divide Brief* data.

As the Figure 5 shows, it appears that U.S. telecom carriers invest more than their European counterparts. However, the *USTelecom US/EU Divide Brief* also notes that many factors may be influencing the investment "gap" it projects, including "geography, density, competition, regional economics, and the regulatory environment" (see Figure 6 below).[190] Thus, the projected impact on broadband investment in the U.S. depicted in the *USTelecom US/EU Divide Brief* comes with many "ifs." *If* geography in the U.S. and the EU were the same, *if* population density were the same, *if* competition were the same, *if* regional economics were the same, and *if* the regulatory environment were the same, then investment *might be* lower. This is certainly not a "slam dunk" regarding the potential impact of the *2015 Title II Order* on investment.

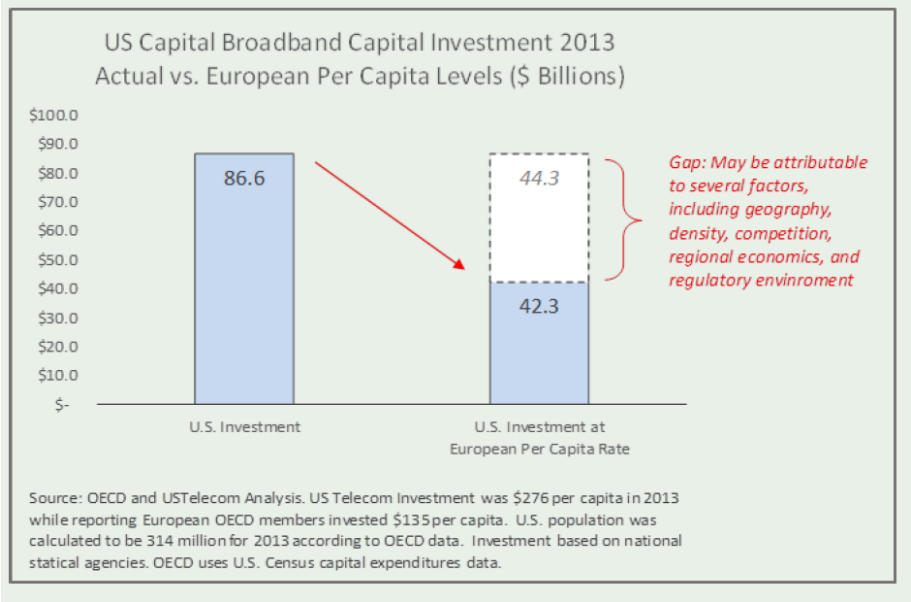

Figure 6: USTelecom admits that more than regulatory factors influence investment

[190] This statement also contradicts the Singer blog post's perspective.

Another major problem with the *USTelecom US/EU Divide Brief's* approach falls into the "apples-to-apples" comparison problem. Namely, the *USTelecom US/EU Divide Brief* equates the *2015 Title II Order* to the entire regulatory framework in place in the EU. As noted by USTelecom, the EU has pursued a dramatically different approach to promoting competition in broadband markets than the U.S.:

> On the whole, Europe has pursued a markedly more regulatory approach to broadband infrastructure than has the U.S. That approach has been built on accepting a single network provider model with intrusive price regulation (e.g., open access, unbundling) to attempt to create competition over that network by opening it to other firms.[191]

Thus, from a regulatory perspective, the *USTelecom US/EU Divide Brief* is measuring the *entirety* of EU regulatory requirements against the *2015 Title II Order*, ignoring the fact that the *2015 Title II Order* exercised forbearance over the very requirements imposed in the EU. The "Title II" of the *2015 Open Internet Order* contains none of the regulatory provisions pursued in the EU, such as unbundling requirements and rate regulation. Rather, the *2015 Title II Order* provides a "light touch" foundation to support open Internet principles. The attempt of the *USTelecom US/EU Divide Brief* to link the *2015 Title II Order* to the EU's overall regulatory framework is not reasonable, and even if other flaws in the *USTelecom US/EU Divide Brief* were not present, the comparison of the regulatory environments does not support USTelecom's position.

7. Other data from USTelecom shows robust investment under Title II is an historical fact

Furthermore, other data from USTelecom shows that for U.S. wireline broadband providers, the Title II environment had some of the highest levels of capital investment ever observed.[192]

[191] *USTelecom US/EU Divide Brief*, p. 1.
[192] Patrick Brogan, "Broadband Investment Ticked Down in 2015," Research Brief, December 14, 2016, p. 3. https://www.ustelecom.org/sites/default/files/Broadband%20Investment%20Down%20in%202015.pdf

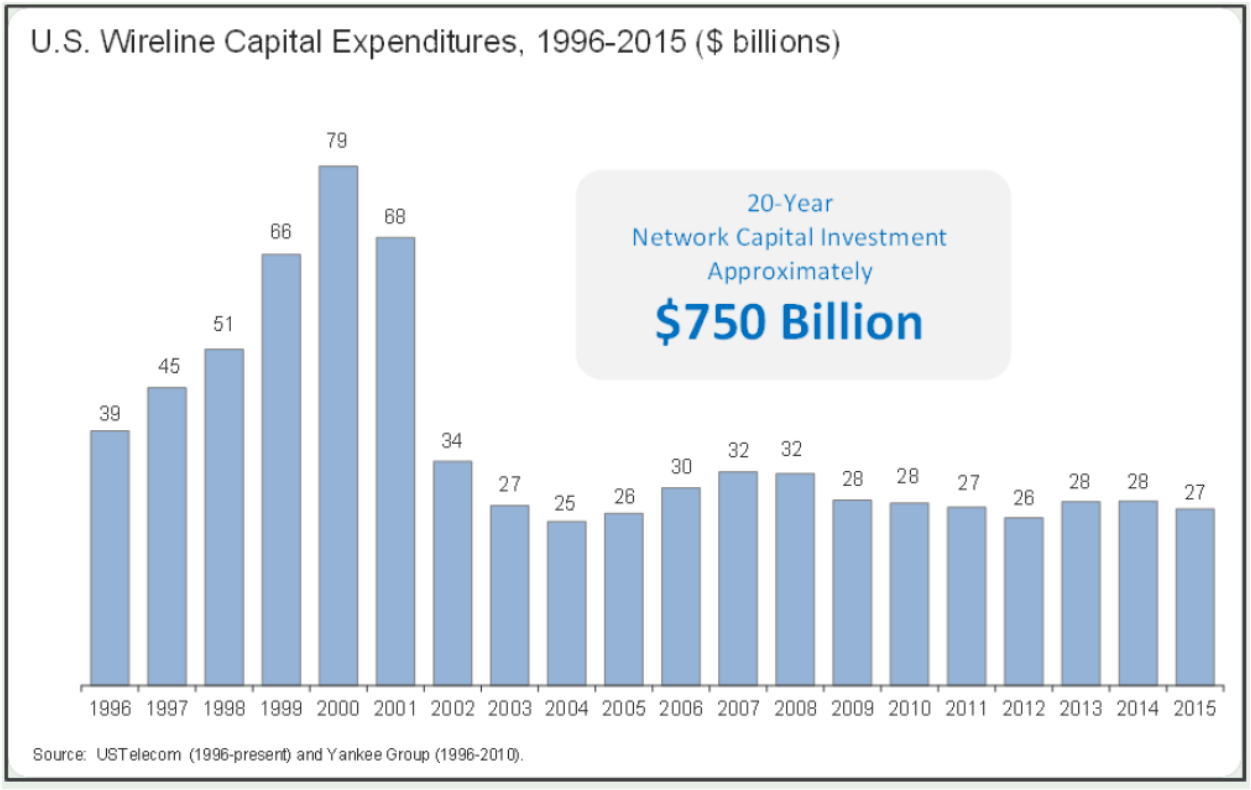

Figure 7: USTelecom data on U.S. Telephone company capital investment--1996-2015

Figure 7 contains USTelecom data that shows telephone company capital expenditures reached historic highs during the early 2000s, and that the reclassification of telephone company broadband to Title I in 2005 did not result in those levels being matched.

VI. Other indicators suggest little impact on network investment from the *2015 Title II Order*

While previous data from periods in which Title II was in effect suggest that Title II and investment are entirely compatible, recent statements by broadband ISPs, broadband ISP actions, and data on the performance of Internet access in the U.S. all suggest that "business as usual" since 2015.

A. Statements by broadband ISPs indicate that Title II does not negatively impact investment

For example, in the lead-up to the *2015 Title II Order*, Frank Shammo, Executive Vice President and CFO of Verizon stated: "I mean to be real clear, I mean this does not influence the way we invest. I mean we're going to continue to invest in our networks and our platforms, both in Wireless and Wireline FiOS and where we need to. So nothing will influence that."[193] Cablevision CEO James Dolan similarly stated, "The idea of more regulation is never great for us, but to be honest, we don't see at least what the Chairman has been discussing as having any real effect on our business."[194] Other cable executives were also not pessimistic regarding the impact of Title II on their operations, given appropriate forbearance on pricing. As was noted in the following exchange between a UBS analyst (John Hodulik) and then Time Warner Cable chief executive Robert D. Marcus:

> Hodulik: You've got potential Title II, which, with all the forbearance we're talking about, won't put a cap on anything anytime soon. But does that change your view on how much pricing power you have in that business?
>
> Marcus: It really doesn't. No one, Title II proponents and opponents alike, have suggested that whatever the FCC does it should include any component of rate regulation.[195]

Similarly, Maggie Wilderotter, CEO of Frontier Communications also pointed to the importance of forbearance on pricing and unbundling, which the *2015 Title II Order* ultimately delivered:

> From what we understand what Title II regulation is the banning paid prioritization and banning blocking and throttling of lawful content and services. What it isn't is there's no

[193] "Verizon: Actually, strong net neutrality rules won't affect our network investment," *Washington Post*, December 10, 2014. https://www.washingtonpost.com/news/the-switch/wp/2014/12/10/verizon-actually-strong-net-neutrality-rules-wont-affect-our-network-investment/?utm_term=.4a26708f1dd4

[194] "Cablevision CEO Plays Down Business Effect of FCC Proposal," *Wall Street Journal*, February 25, 2015. https://www.wsj.com/articles/cablevision-net-neutrality-fcc-proposal-earnings-subscribers-1424872198

[195] "Comcast, Charter and Time Warner Cable all say Obama's net neutrality plan shouldn't worry investors." Washington Post, December 16, 2014. https://www.washingtonpost.com/news/the-switch/wp/2014/12/16/comcast-charter-and-time-warner-cable-all-tell-investors-strict-net-neutrality-wouldnt-change-much/?utm_term=.c9863e6aad8f

> rate regulation that's being offered up here in the proposal for Title II, no tariffing and no last mile unbundling so we're not forced to open up our networks to competitors.[196]

Sprint's CEO told the FCC that forbearance would result in a positive investment environment:

> Regardless of the legal grounds proposed, Sprint has emphasized repeatedly that net neutrality rules must give mobile carriers the flexibility to manage our networks and to differentiate our services in the market. With that said, Sprint does not believe that a light touch application of Title II, including appropriate forbearance, would harm the continued investment in, and deployment of, mobile broadband services.[197]

Jasper Dane, the CEO of Sonic, a CLEC which relies on both unbundled elements and its own FTTP notes that any expected "burden" of Title II, given appropriate forbearance, would only affect bad actors:

> Today, Internet service providers are required to publish for the FCC a disclosure of traffic management practices. So we publish a disclosure. I think it says we don't touch your bits. We don't modify, we don't filter, we don't engage in deep pack inspection. So, I think from a compliance perspective, if the assumption is that Title II will be by and large gutted, or rather they engage in forbearance of all provisions and begin to re-enable provisions that allow them to assure the traffic is treated equally, my expectation is those of use that treat traffic equally will have a pretty light regulatory burden.[198]

Comcast CEO Neil Smit told investors in May 2015:

> On Title II, it really hasn't affected the way we have been doing our business or will do our business. We believe on Open Internet and while we don't necessarily agree with the Title II implementation, we conduct our business the same we always have, transparency and nonpaid peering and things like that.[199]

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[196] "Frontier's Wilderotter is comfortable with Title II reclassification," *Fierce Telecom*, Feb 9, 2015. http://www.fiercetelecom.com/telecom/frontier-s-wilderotter-comfortable-title-ii-reclassification

[197] Letter from Sprint CTO Stephen Bye to Tom Wheeler, January 15, 2015. Available at: https://s3.amazonaws.com/s3.documentcloud.org/documents/1503770/sprint-title-ii-support-letter-to-fcc.pdf

[198] "Internet Provider Sonic's CEO: Title II Is Only A Regulatory Burden If You're Doing Something Bad," *Techdirt*, December 5, 2014. https://www.techdirt.com/blog/netneutrality/articles/20141202/17293329305/internet-provider-sonics-ceo-title-ii-is-only-regulatory-burden-if-youre-doing-something-bad.shtml

[199] THOMSON REUTERS STREETEVENTS, EDITED TRANSCRIPT, Q1 2015 Comcast Corp Earnings Call, MAY 04, 2015, p. 16. http://files.shareholder.com/downloads/CMCSA/0x0x826056/c53b6711-299e-49e7-bbe0-fa5ccbb12142/Comcast_1Q15_Earnings_Transcript.pdf

As will be discussed further below, consistent with Mr. Smit's statement, later in 2015 Comcast announced it would roll out DOCSIS 3.1, and gigabit broadband service, to its entire service area, which it expects to complete in 2018.[200] This action suggests that Title II is consistent with continuing incentives to invest.

B. ISP actions suggest that the *2015 Title II Order* has not harmed investment

Red flags might arise if there had been an obvious change of course with regard to capital attraction and capital investment following the issuance of the *2015 Title II Order*. What is observed, however, is a short-term response of broadband ISPs that indicates that "business as usual" has persisted. For example, Verizon recently announced massive fiber-optic cable purchases from Corning and Prysmian (more than $1.3 billion combined) to expand its 5G wireless broadband networks.[201] Under the Corning deal, Verizon will purchase up to 37.2 million miles of optical fiber and related hardware over the next three years; with the Prysmian purchase Verizon will buy another 10.6 million miles of ribbon and loose tube cables, also over a three-year horizon.[202]

News of AT&T and Verizon's bidding war for Straight Path communications, which owns licenses for spectrum potentially applicable for 5G is also notable, with Verizon ultimately

[200] "Comcast planning gigabit cable for entire US territory in 2-3 years, *ARS Technica*, August 24, 2015. https://arstechnica.com/business/2015/08/comcast-planning-gigabit-cable-for-entire-us-territory-in-2-3-years/ See: also: "Comcast has just started rolling out its gigabit internet service," *The Verge*, Dec 26, 2015, https://www.theverge.com/2015/12/26/10667998/comcast-begins-gigabit-internet-service . See also: "Comcast's gigabit cable will be in 15 cities by early 2017: San Francisco, Seattle, Denver, and others to get gigabit upgrade next year," *ARS Technica*, November 2, 2016. https://arstechnica.com/information-technology/2016/11/comcasts-gigabit-cable-will-be-in-15-cities-by-early-2017/

[201] See, "Verizon buying 37 million miles of fiber to boost its wireless network, Verizon buys fiber from Corning, with a focus on wireless Internet—not FiOS." *ARS Technica*, April 18, 2017, https://arstechnica.com/information-technology/2017/04/verizon-spends-1b-on-fiber-but-its-for-5g-wireless-not-more-fios/ . See also, "Verizon signs $300M optical cable purchase with Prysmian," *Fierce Telecom*, May 8, 2017. http://www.fiercetelecom.com/telecom/verizon-signs-300m-optical-component-purchase-prysmian

[202] *Id.*

paying over $3 billion for Straight Path, a company whose market valuation had been $400 million in late 2016.[203]

Likewise, Verizon and CenturyLink have also recently displayed an appetite for wireline telecommunications assets, with their respective acquisitions of XO Communications[204] and Level 3 Communications. CenturyLink paid a 42 percent premium over market value for Level 3.[205] These activities all suggest that capital continues to be attracted by the telecommunications sector under the Title II regime.

Similarly, the two largest cable companies, Comcast and Charter (Spectrum), have expanded investment:

> Capex tied to scalable infrastructure (i.e. network equipment) grew from $1.539 billion [for 2015] to $1.827 billion [for 2016], as Comcast embarked on a quest to deliver gigabit speeds and convert its networks to the DOCSIS 3.1 standard. Next year, Comcast's scalable infrastructure capex is projected to grow to $2.602 billion.
>
> Charter Communications, the No. 2 U.S. cable operator behind Comcast, saw its scalable infrastructure capex increase 18% to $2.009 billion last year [2016]. CPE capex increased 5% to $2.761 billion.
>
> Overall, Comcast's capex increased 7.3% to $7.597 billion in 2016, and it's projected to grow to $8.445 billion in 2017. Charter capex was up around 8.6% to $7.545 billion.[206]

[203] "Verizon wins bidding war to acquire Straight Path for more than $3 billion," CNBC, May 11, 2017. http://www.cnbc.com/2017/05/10/verizon-wins-bidding-war-to-acquire-straight-path-for-more-than-3-billion-report.html "Verizon will acquire Straight Path for $184 a share in an all-stock transaction, reflecting an enterprise value of approximately $3.1 billion, the companies said. . . . "Straight Path was worth around $400 million two months ago and had just nine employees as of October."

[204] "Verizon's XO Communications acquisition clears FCC's approval," *Fierce Telecom*, November 17, 2016. http://www.fiercetelecom.com/telecom/verizon-s-xo-communcations-acquisition-clears-fcc-s-approval

[205] "CenturyLink to Buy Level 3 for $34 Billion in Cash, Stock," *Bloomberg*, October 31, 2016. https://www.bloomberg.com/news/articles/2016-10-31/centurylink-agrees-to-buy-level-3-for-34-billion-in-cash-stock "The acquisition values Level 3 at $66.50 a share, the companies said in a statement Monday. That's about 42 percent above where the Broomfield, Colorado-based company was trading last week..."

[206] "Cable capex: Comcast, Charter to ramp up network spending for combined $16B outlay in 2017," *FierceCable,* March 23, 2017. http://www.fiercecable.com/cable/cable-capex-top-ops-comcast-and-charter-stabilize-cpe-spending-but-ramp-up-network

Figure 8 shows a summary of Comcast and Charter capital expenditures. In summary, recent industry news does not suggest an investment contraction in the broadband sector.

COMCAST CAPEX	2015 (in mils.)	2016	2017 (projected)
CPE	$3,698	$3,665	$3,195
Scalable infrastructure	$1,539	$1,828	$2,602
Line extensions	$886	$1,208	$1,381
Support capital	$917	$896	$1,366
Total capex	$7,040	$7,597	$8,554

CHARTER CAPEX	2015 (in mils.)	2016	2017 (projected)
CPE	$2,630	$2,761	$2,583
Scalable infrastructure	$1,702	$2,009	$1,754
Line extensions	$977	$1,005	$1,289
Upgrade/rebuild	$594	$610	$565
Support capital	$1,046	$1,160	$1,302
Total capex	$6,949	$7,545	$7,493

Figure 8: Comcast/Charter Capex (http://www.fiercecable.com/cable/cable-capex-top-ops-comcast-and-charter-stabilize-cpe-spending-but-ramp-up-network)

C. Broadband performance data suggests investment has continued under Title II

Other evidence of investment is reflected in broadband performance data. If investment were being withheld by broadband ISPs, then it would be reasonable to see a plateau or decline in measured broadband speeds following the *2015 Open Internet Order*. However, observed broadband speeds have shown above-average growth during the past two years. Akamai has

published average connections speeds in the United States since 2009.[207] These results (with each report for first quarter data) are shown in Table 1.

Table 1: U.S. Download Speeds, 2009-2017		
Akamai Q1 Reports	Average Download Speeds (Mbps)	Annual Growth Rate
2009	4.2	
2010	4.7	12%
2011	5.3	13%
2012	6.7	26%
2013	8.6	28%
2014	10.5	22%
2015	11.9	13%
2016	15.3	29%
2017	18.7	22%
	2009-2017 Average	**21%**

The data in Table 1 shows substantial increases in broadband speeds between the first quarter of 2015 and the first quarter of 2017 (57.1 percent), with year-over-year changes for 2016 being the highest during the 2009-2017 period, and with 2017 reflecting performance that is above-average. With the gains in 2017, the U.S. entered the top-10 nations reported by Akamai (at number 10). The U.S. had previously only appeared in the top-10 Akamai Q1 rankings in 2013. The Akamai data does not raise red flags regarding the impact of Title II on investment or broadband performance.

This information, and the investment activities discussed above, all offer preliminary support for the proposition that the "light touch" Title II approach associated with the *2015 Title II Order* has not had a significant negative impact on broadband ISPs.

[207] Data taken from annual reports available at: https://www.akamai.com/us/en/about/our-thinking/state-of-the-internet-report/global-state-of-the-internet-connectivity-reports.jsp

D. There is not agreement in the academic literature on the issue of network neutrality and investment

The academic literature does not yield uniform conclusions on the impact of network neutrality on investment. However, the academic studies reviewed by AARP had a focus on investment that is more broad than the broadband ISP industry-related studies discussed above, which focused on the broadband ISP impact alone. But while the academic studies generally take a more appropriate approach, their conclusions on investment are frequently nuanced, conditioned on numerous assumptions, and not always in agreement.

Academic studies make simplifying assumptions, and direct application of a study's results to real-world situations may be difficult. For example, Musacchio et al. (2009) study the interaction between many content providers, who generate revenues strictly through advertising, and monopoly ISPs connecting content providers to consumers. Ultimately, their conclusions are conditional on numerous assumptions, making the interpretation of their results difficult to associate with unconditional answers. "From our results, when the ratio of advertising rates to the constant characterizing price sensitivity is an extreme value, either large or small, two-sided pricing is preferable. . . .[however] ISPs in a two-sided pricing regime have the potential to overcharge content providers, and this effect becomes stronger as the number of ISPs increases."[208] Other studies offer more concise parameters. Krämer and Wiewiorra (2010) focus on congestion and prioritization of access. They assume that ISPs can build a ''fast-lane'' and conclude that there may be long-run investment benefits from discrimination, but that content

[208] Musacchio, J., Schwartz, G., and Walrand, J. (2009). "A Two-Sided Market Analysis of Provider Investment Incentives with an Application to the Net-Neutrality Issue." *Review of Network Economics*, 8(1) 22-39. In the context of their analysis "two-sided pricing" reflects the potential for "fast lanes" and non-neutral broadband ISP networks.

providers will be harmed in the short run.[209] In a widely cited study, Choi and Kim (2010) examine investment and innovation incentives in the context of network neutrality. They find that "contrary to ISPs' claims that net neutrality regulations would have a chilling effect on their incentive to invest, we cannot dismiss the possibility of the opposite." They also note the potential for quality discrimination: "We find that the ISP can have incentive to do quality degradation in the discriminatory network, but not in the neutral network. This is because in the neutral network the ISP's quality degradation only decreases the network access fee without yielding a higher rent extraction."[210] Similarly, Cheng et al. (2011) model two content providers who can avoid congestion by dealing with ISPs who can charge for preferential access. They find that the elimination of network neutrality benefits ISPs and hurts content providers. On the matter of investment, they "find that the incentive to expand infrastructure capacity for the broadband service provider and its optimal capacity choice under NN [network neutrality] are higher than those under the no-net-neutrality (NNN) regime, except in some specific cases. Under NN, the broadband service provider always invests in broadband infrastructure at the socially optimal level but either under- or overinvests in infrastructure capacity in the absence of NN."[211] Economides and Hermalin (2012), predict that ISP investment will be higher under non-neutral networks, but also find that network neutrality is welfare-superior to discrimination and network prioritization: "we derive results that suggest that when household utility is a significantly greater component of welfare than content providers' profits, then network neutrality can still be the welfare-superior policy even accounting for the ISP's bandwidth-

[209] Krämer, J., Wiewiorra, L., (2010). "Network Neutrality and Congestion-Sensitive Content Providers: Implications for Service Innovation, Broadband Investment and Regulation." Working Paper, Karlsruhe Institute of Technology.
[210] Choi, J.P., Kim, B.C., (2010). "Net neutrality and investment incentives." *RAND Journal of Economics* 41, 446–471.
[211] Cheng, H.K., Bandyopadhyay, S., Guo, H., (2011). "The debate on net neutrality: a policy perspective. *Information Systems Research* 22,60–82.

building incentives." They also note that their model is limited to examining discrimination on the content-provider side of the market, and that it will be important to explore: "what happens when the ISP is engaging in price discrimination on both sides of the market, that is, unlike in the analysis in this article, exploring what happens if the ISP can also engage in discrimination on the household side of the market."[212] Alternatively, Bourreau et al. (2015) find that discrimination is welfare enhancing under some circumstances, but they also find that the discriminatory regime has undesirable effects. They find that discrimination hurts the small content providers more than the large ones. They also note that the discriminatory regime could bring forth a risk of sabotage by ISP's of content providers' traffic. They also find that under some conditions, ISPs benefit from degrading the quality of the non-priority lane in order to extract higher profits from the priority lane.[213]

E. Impact of the *2015 Title II Order* on small ISP investment

The *2017 NPRM* raises the issue of alleged negative impacts of Title II classification on small broadband ISPs. According to the *2017 NPRM,* several small ISPs have informed the Commission of negative operational impacts, and of difficulties with access to capital.[214] However, the Commission has now recently heard from a coalition of 30 small ISPs who report no negative impact on investment, and who strongly support the existing framework:

> We have encountered no new additional barriers to investment or deployment as a result of the 2015 decision to reclassify broadband as a telecommunications service and have long supported network neutrality as a core principle for the deployment of networks for the American public to access the Internet.

[212] Economides, N., Hermalin, B. (2012) "The economics of network neutrality," *RAND Journal of Economics*, Vol. 43, No. 4, pp. 602–629.
[213] Bourreau, M., Kourandi, F., and Valletti, T. (2015). "Net Neutrality with Competing Internet Platforms." *The Journal of Industrial Economics*, 63(1), 30-73.
[214] *2017 NPRM*, ¶47.

> We wish to further express our opposition to the proposed plans to reverse course and again undergo another reclassification of broadband back into an information service. The federal courts have made it very clear that network neutrality depends on the FCC maintaining that broadband is a telecommunications service and that other approaches have already failed as a legal matter. We have always supported a neutral network approach to the Internet and see no reason why it should not be required as a matter of law.
>
> Without a legal foundation to address the anticompetitive practices of the largest players in the market, the FCC's current course threatens the viability of competitive entry and competitive viability. As direct competitors to the biggest cable and telephone companies, we have reservations about any plan at the FCC that seeks to enhance their market power without any meaningful restraints on their ability to monopolize large swaths of the Internet.[215]

This statement contradicts the small ISP investment claims identified in the *2017 NPRM,* and indicates that these small ISPs view the *2015 Title II Order* framework as benefitting their business.

Should the full record support the proposition that the investment potential of small ISPs has been harmed by Title II, AARP believes that would be reasonable for the Commission to address the small ISP issue separately. The alleged difficulties associated with small providers should not be an excuse to abandon the reasonable constraints on behavior and reporting requirements that the *2015 Title II Order* also imposed on large broadband ISPs. AARP looks forward to reviewing information that small ISPs will provide in the comment phase of this proceeding.

F. Summary: The *2017 NPRM* is wrong about investment

The sources upon which the *2017 NPRM* relies to support the proposition that the *2015 Title II Order* has had a negative impact on investment are deeply flawed. None of the studies look beyond the impact on broadband ISPs, and the approaches utilized by each of the studies are of

[215] Letter to Ajit Pai from 30 small ISPs, June 27, 2017. "30 small ISPs urge Ajit Pai to preserve Title II and net neutrality rules Letter: Title II didn't hurt investment, is good for small ISPs and customers." *ArsTechnica*, June 28, 2017. https://arstechnica.com/tech-policy/2017/06/30-small-isps-urge-ajit-pai-to-preserve-title-ii-and-net-neutrality-rules/

doubtful worth. There is simply not sufficient data in the cited studies for the Commission to now draw a definitive conclusion on the impact of Title II on investment. Similarly, academic literature to date does not offer a definitive answer regarding the impact on investment and Title II.

G. Points of evaluation for future investment studies

There is no doubt, however, that the Commission will be inundated with more "investment" studies as it builds the record in this proceeding. As it considers those studies, the Commission should pay close attention to AARP's critique of the *2017 NPRM's* cited studies. Below, AARP provides a non-exhaustive list of factors that the Commission should consider as it evaluates any additional studies:

- Do the investment studies include all components of the "two-sided" broadband marketplace? In the "virtuous circle," broadband ISPs invest; edge providers invest; and so do "edge provider/end-users" who pursue blogging, or host YouTube channels. A full evaluation of the impact of Title II on investment requires that all components of the virtuous circle be considered.

- Do the investment studies have a sufficient time series of data which allows the comparison of Title I to Title II?

- Do the investment studies reasonably identify, and control for, all factors other than regulation that can influence investment decisions?

- Do the investment studies appropriately recognize that periods, such as the pre-2005 period for telephone companies, were associated with Title II regulation?

- Are the studies fully transparent with regard to data sources? Are the data sets either publicly available from the original sources, or available from the study's author, to enable verification and replication of results?

- Do the metrics utilized in the studies actually measure relevant investment, or are inappropriate proxies employed?

- Are international comparisons "apple-to-apples," or do they overlook significant structural differences across nations?

- Do the investment studies rely on esoteric statistical or econometric models that are unnecessarily complex?

VII. Other issues raised by the *2017 NPRM*

A. Consumer wireline broadband Internet access markets are not competitive

If the market for broadband Internet access were subject to economic competition, then market forces could discipline broadband Internet access provider behavior. If consumers had choice from among multiple broadband ISPs, then consumers could "vote with their pocket books" and select a different provider if a broadband ISP blocked, throttled, or otherwise interfered with a consumer's ability to access the "lawful Internet content, applications, and services of their choosing." Such a competitive ISP environment existed during the period when dial-up was the dominant method for accessing the Internet. Consumers had many choices of ISPs, and if a consumer was unhappy with ISP performance, they could easily choose another.[216] Because the dial-up connection was provided under Title II, the access provider could not block or throttle the Internet user's choice of ISP, or selection of other Internet services.

However, broadband markets are not competitive, and persistent entry barriers limit consumer choice. The FCC's most recent report on fixed broadband shows that broadband is delivered almost exclusively by legacy telephone companies and legacy cable companies.[217] In residential wireline markets, telephone companies have refrained from competing against other telephone

[216] In the year 2000, about 7,400 ISPs existed in the U.S. "The Best and Worst ISPs," *PC World*, November 2000.
[217] "2016 Measuring Broadband America Fixed Broadband Report: A Report on Consumer Fixed Broadband Performance in the United States." Federal Communications Commission Office of Engineering and Technology and Office of Strategic Planning & Policy Analysis, December 1, 2016.

companies, and cable companies have refrained from competing against other cable companies. Under the best of circumstances, for most consumers, the result is a duopoly market—two choices for a broadband connection. Other evidence shows that for higher speed broadband, monopoly market conditions exist for most consumers.

For example, a 2016 study based on FCC Form 477 data, filed in a California Public Utilities Commission investigation into the status of competition in that state, found that most California households face a duopoly market for broadband service at any speed. Furthermore, the study also found that for broadband at speeds above 25 Mbps downstream, the overwhelming majoring of California households face monopoly market conditions.[218]

Table 2: Percent of California households and number of wireline broadband (any speed) provider choices

County	No Provider	One Provider	Two Providers (Duopoly)	Three Providers	Four Providers	Five Providers
Alameda	1.23%	2.44%	58.21%	38.12%	0.00%	0.00%
Contra Costa	1.94%	2.07%	63.34%	28.20%	4.46%	0.00%
Fresno	5.61%	12.10%	82.28%	0.01%	0.00%	0.00%
Humboldt	18.84%	11.51%	69.34%	0.31%	0.00%	0.00%
Kern	5.84%	14.42%	79.74%	0.00%	0.00%	0.00%
Los Angeles	0.28%	3.24%	78.82%	15.82%	1.72%	0.12%
Orange	1.40%	5.74%	87.86%	4.89%	0.12%	0.00%
Riverside	2.61%	6.47%	90.81%	0.12%	0.00%	0.00%
Sacramento	2.45%	4.52%	64.43%	27.26%	1.34%	0.00%
San Bernardino	3.85%	10.60%	83.00%	2.55%	0.00%	0.00%
San Diego	2.90%	3.68%	90.35%	3.06%	0.00%	0.00%
San Francisco	1.99%	0.18%	9.10%	40.79%	37.68%	10.26%
San Joaquin	4.22%	5.77%	89.98%	0.03%	0.00%	0.00%
San Mateo	2.22%	2.02%	41.42%	33.63%	17.53%	3.19%
Santa Clara	2.86%	4.86%	67.97%	24.13%	0.18%	0.00%
Shasta	8.53%	20.19%	71.28%	0.00%	0.00%	0.00%
Ventura	1.18%	5.71%	93.07%	0.04%	0.00%	0.00%

[218] Prepared Testimony of Trevor R. Roycroft, Ph.D. *CPUC Investigation I.15-11-007. Order Instituting Investigation into the State of Competition Among Telecommunications Providers in California, and to Consider and Resolve Questions raised in the Limited Rehearing of Decision 08-09-042.* Filed on behalf of The Utility Reform Network (TURN), June 1, 2016. The study is based on June 2105 Form 477 data. The study is available at: http://roycroft-at-ohio.org/wp-content/uploads/2016/08/Roycroft_Final_Public_OII_Testimony_No_Appendices.pdf

The county-level information summarized in Tables 4 and 5 is from the 2016 California study of consumer choice, which used data from the Census Block level in California's 15 largest counties and two smaller, more rural, counties. Combined, 83.5% of California's population resides in these counties. Table 2 shows consumer choice for broadband at any speed. Table 3 shows choice for broadband at the FCC's 25/3 Mbps benchmark.

Table 3: Percent of California households and number of broadband provider choices at 25/3 Mbps

County	No Provider	One Provider (Monopoly)	Two Providers	Three Providers	Four Providers	Five Providers
Alameda	2.51%	53.30%	39.94%	4.25%	0.00%	0.00%
Contra Costa	2.85%	56.97%	33.31%	6.46%	0.40%	0.00%
Fresno	14.88%	75.60%	9.53%	0.00%	0.00%	0.00%
Humboldt	24.57%	75.12%	0.31%	0.00%	0.00%	0.00%
Kern	13.81%	77.86%	8.33%	0.00%	0.00%	0.00%
Los Angeles	0.47%	65.93%	33.03%	0.57%	0.00%	0.00%
Orange	2.97%	78.68%	18.32%	0.04%	0.00%	0.00%
Riverside	3.74%	48.21%	48.05%	0.00%	0.00%	0.00%
Sacramento	5.29%	59.95%	29.86%	4.84%	0.07%	0.00%
San Bernardino	6.97%	50.09%	42.94%	0.00%	0.00%	0.00%
San Diego	4.45%	85.69%	9.87%	0.00%	0.00%	0.00%
San Francisco	2.13%	9.71%	45.18%	30.90%	10.16%	1.92%
San Joaquin	7.86%	83.10%	9.04%	0.00%	0.00%	0.00%
San Mateo	4.07%	38.82%	36.59%	18.90%	1.57%	0.05%
Santa Clara	4.92%	63.60%	28.98%	2.49%	0.01%	0.00%
Shasta	26.08%	73.92%	0.01%	0.00%	0.00%	0.00%
Ventura	2.47%	58.20%	39.33%	0.00%	0.00%	0.00%

The results of the study show that California households face limited competition and choice for wireline voice and broadband service at any speed.[219] For higher speed broadband, a substantial majority of households face a monopoly market—only their cable company provides broadband

Table 4: Summary of Wireline Broadband and Voice Choices for all Households in the Study						
	No Provider	**One Provider (Monopoly)**	**Two Providers (Duopoly)**	**Three Providers**	**Four Providers**	**Five Providers**
Any Broadband and Voice						
Percent of all households	2.06%	4.97%	76.42%	13.67%	2.42%	0.46%
Broadband at 25Mbps/3Mbps						
Percent of all households	3.83%	63.82%	29.39%	2.50%	0.40%	0.07%

with download speeds above 25 Mbps. Table 4 summarizes the information shown in Tables 2 and 3.

Also, consistent with the fact that consumers face broadband markets that are not competitive, this Commission has acknowledged the persistent entry barriers in broadband markets through recent proceedings. For example, the Commission is currently proposing new rules that would diminish entry barriers associated with pole attachments, and is also considering another attempt to preempt state and local laws that impede broadband market entry.[220] In a similar vein, the Commission recently released a draft Notice of Inquiry to address entry barriers associated with multi-tenant buildings.[221] These actions recognize the persistence of entry barriers in broadband Internet access markets. While well-intentioned, however, they are not likely to solve the

[219] These results are also consistent with the FCC's 2016 report on fixed broadband, which shows fixed broadband markets as being dominated by telephone and cable companies.
[220] *In the Matter of Accelerating Wireline Broadband Deployment by Removing Barriers to Infrastructure Investment*, WC Docket No. 17-84, Notice of Proposed Rulemaking, Notice of Inquiry, and Request for Comment, April 21, 2017, Section II(A) addresses pole attachments, Section III addresses state and local laws inhibiting broadband deployment.
[221] "Improving Competitive Broadband Access to Multiple Tenant Environments," Notice of Inquiry - GN Docket No. 17-142, June 1, 2017.

problem of residential broadband markets where consumers continue to face little choice and firms with market power. The lack of competition in last-mile broadband markets, which is a direct result of persistent economies of scale,[222] and other entry barriers, continues to enable the potential for broadband ISPs to act arbitrarily in a manner that harms Internet consumers, competition, and innovation. If consumers had numerous alternatives of broadband Internet access, market forces could mitigate the ability of broadband ISPs to pursue harmful unilateral actions. With regard to an open Internet, absent robust broadband market forces, consumers need regulatory protection, and the *2015 Title II Order* provided the necessary framework to ensure that the Commission had the needed authority to protect consumers or edge providers from bad actors which might block, throttle, or otherwise interfere with consumers' access to the lawful content, applications, and services of their choosing.

B. Edge providers face a monopoly bottleneck when reaching their customers

Broadband Internet access connections link consumers to edge providers. For example, Verizon tells its customers that broadband Internet access allows end-users to "Stream, download, upload, game, share, [and] connect . . . . Do what you want online, right now."[223] When a broadband Internet access customer "streams, downloads, uploads, games, shares, and/or connects" they engage with edge providers. From the edge provider's perspective, the broadband subscriber is their customer. This relationship, where buyers and sellers are brought together on a platform provided by a third party creates what economists call a "two-sided" market. A two-sided market arises when "(1) two sets of agents interact through an intermediary or platform, and (2)

[222] See, for example, Park, E. and Taylor, R. "Barriers to Entry Analysis of Broadband Multiple Platforms: Comparing the U.S. and South Korea," Paper to be presented at the Telecommunications Policy Research Conference, September 29-October 1, 2006, Washington, DC. See also, Glass, V. and Stefanova, S. "Economies of scale for broadband in rural United States," *Journal of Regulatory Economics* (February 2012) 41:100–119.
[223] http://archive.is/f9Rzh

the decisions of each set of agents affects the outcomes of the other set of agents, typically through an externality."[224] In the case of broadband Internet access, the externality associated with the two-sided market sets up the "virtuous circle" of investment and innovation described by the Commission in its *2010 Open Internet Order*—edge providers will invest more if they can reach a large number of subscribers who have high-quality broadband services, and subscribers demand high-quality broadband services to benefit from the existence of a large number of edge providers, thus promoting investment by broadband ISPs.[225]

To satisfy the demands of their customers, edge providers must utilize the broadband connection that their customer has purchased from their ISP—the sender's traffic must traverse the customer's broadband ISP's network. When a customer makes a purchase from Amazon, subscribes to Hulu or Netflix, or reads a blog post, the delivery of the content or services requires pure transmission. While the *2017 NPRM* raises questions regarding whether a consumer's broadband connection requires information services to function,[226] the edge provider's experience with their customer's broadband connection is decidedly telecommunications alone.

The potential for broadband ISPs to impose charges to the edge provider on the "sender side" traffic leaves the edge provider facing an unequivocal monopoly market.[227] For example, mass-market broadband users do not maintain multiple wireline broadband connections, and this lack of "multi-homing" results in only one pathway to the edge provider's customer. While the *2017*

[224] See, for example, Marc Rysman, "The Economics of Two-Sided Markets," *Journal of Economic Perspectives*, vol. 23, no. 3, Summer 2009 (pp. 125-43).
[225] *2010 Open Internet Order*, ¶14.
[226] *2017 NPRM,* ¶37.
[227] The terminating access monopoly problem has long been recognized as an issue in telecommunications. See, for example, Neuchterlein, J. and Weiser, P. *Digital Crossroads,* 2nd ed. MIT Press, 2013, p. 259. With regard to broadband Internet access markets, the FCC recognized the issue in the *2010 Open Internet Order*: "A broadband provider could force edge providers to pay inefficiently high fees because that broadband provider is typically an edge provider's only option for reaching a particular end user. Thus broadband providers have the ability to act as gatekeepers." *2010 Open Internet Order,* ¶24, footnotes omitted.

NPRM considers the potential to return consumer-facing broadband Internet access services to Title I regulation, the utilization of broadband Internet access services by edge providers to deliver content and services is not subject to the potential blending of information and telecommunications considered elsewhere in the *2017 NPRM*.[228] Rather, edge providers are sending the content desired by their user/subscriber to the user/subscriber, and thus only require pure transmission from the broadband ISP. As noted by the D.C. Circuit in the *Verizon v. FCC* decision:

> It is true, generally speaking, that the "customers" of broadband providers are end users. But that hardly means that broadband providers could not also be carriers with respect to edge providers. . . .[229]

The terminating monopoly faced by edge providers indicates that a reclassification of broadband Internet access facilities as an information service is not reasonable. This fact was recognized in the *2015 Title II Order*.

> For the reasons we review herein, the reclassification of BIAS (broadband Internet access service) necessarily resolves the edge-provider question as well. In other words, the Commission agrees that a two-sided market exists and that the beneficiaries of the non-consumer side either are or potentially could be all edge providers. Because our reclassification decision treats BIAS as a Title II service, Title II applies, as well, to the second side of the market, which is always a part of, and subsidiary to, the BIAS service.[230]

If the Commission were to reclassify broadband Internet access based on the end-user's perspective alone, it would ignore the reality of millions of edge providers who need nothing more than pure transmission capability to provide the applications, content, and services that

[228] See, for example, *2017 NPRM,* ¶¶36-38.
[229] *Verizon v. FCC,* 740 F.3d 623, 653.
[230] *2015 Title II Order,* ¶338.

their customers have requested. Because the network edge would be subject to potential monopoly holdup, reduced edge innovation and investment could result.

C. The Internet has changed dramatically since the *Cable Modem Order*

The *2017 NPRM* proposes to revert to a Title I information service classification of broadband Internet access service, and the *2017 NPRM* revisits and advances the logic previously expressed by the Commission in the *Cable Modem Order*.[231] However, the *2017 NPRM* also recognizes that the *Cable Modem Order* was based on a view of how consumers utilize broadband Internet access services that may no longer reflect current use, and asks for comment on whether the *Cable Modem Order* or the *2015 Title II Order* have a more accurate perspective on how consumers now perceive and utilize broadband Internet access services.[232]

The *Cable Modem Order* was necessarily based on perceptions of Internet access in the early 2000s. The *Cable Modem Order* was adopted when broadband was in its infancy. According to FCC data, there were approximately 9.6 million broadband connections in 2001, of which 5.2 million were on cable platforms.[233] However, 80 percent of Internet users still connected using dial-up services.[234] Thus, the dominant method by which end-users accessed the Internet continued to be through dial-up connections, and the network effects associated with broadband, which ultimately would inspire the *2010 Open Internet Order's* "virtuous circle" perspective, were only just beginning. Dial-up Internet access was provided by firms that offered consumers an online platform that included *Internet access* as one of the services. Many dial-up ISPs provided consumers with a proprietary software "portal" through which they could utilize

[231] *2017 NPRM,* ¶¶28, 36.
[232] *2017 NPRM,* ¶28.
[233] FCC, Industry Analysis Division, Common Carrier Bureau, "High-Speed Services for Internet Access: Subscribership as of June 30, 2001," February 2002, Table 1.
[234] NTIA, "A NATION ONLINE: How Americans Are Expanding Their Use Of The Internet," February 2002, Chapter 4. http://www.ntia.doc.gov/legacy/ntiahome/dn/anationonline2.pdf

proprietary information services, as well as access Internet content and services.[235] The most popular dial-up ISP in 2001 was America Online (AOL), with over 21 million subscribers. AOL offered consumers an online "walled garden" that provided proprietary content, news groups, bulletin boards, instant messaging, and e-mail, as well as access to the "web."[236] Smaller ISPs offered services in the same spirit, but without the proprietary network effects enjoyed by AOL.

During this period, edge providers were a much less diverse group than is the case today, and edge-provider technology was not mature. Online video was virtually unheard of, e-commerce sales were less than one percent of today's level,[237] and modern social media had not yet been invented. Internet users were confronted with the pure "client/server" model, where the end user accessed the content and services from remote computers connected to the Internet. And because content delivery networks did not yet exist, Internet users were forced to traverse many Internet hops to reach the web content and services of their choice, all but ensuring the "world wide wait."[238] The potential for low levels of service quality associated with using the web encouraged users to stay closer to their ISP's walled garden, which, of course, explained the popularity of larger ISPs like AOL, which provided proprietary content and delivered substantial

[235] Dial-up ISPs required proprietary software that had to be loaded on the consumer's PC. Given the impracticality of downloading software over dial-up connections, marketing strategies then known as "carpet bombing" of software CDs were used. Those CDs were sent in the mail, placed as newspaper inserts, or left in bins at retail stores. See, for example, "America Online Sets New Round of 'Carpet-Bombing' Software," *Wall Street Journal*, September 24, 1998. http://online.wsj.com/news/articles/SB906565407265912000

[236] See the AOL commercial archived at: http://www.youtube.com/watch?v=1npzZu83AfU

[237] About $32 billion in 2001 vs. $390 billion in 2016. See, Census reports available at: https://www.census.gov/retail/mrts/www/data/pdf/ec_current.pdf and https://www2.census.gov/retail/releases/historical/ecomm/01q4.pdf

[238] "W3C Recommendations Reduce 'World Wide Wait'; Tired of having to make coffee while you wait for a home page to download?" July 8, 1999. http://www.w3.org/Protocols/NL-PerfNote.html . In response, innovation at the network edge introduced the first content delivery network, Akamai, which launched in 2001. (http://en.wikipedia.org/wiki/Akamai_Technologies#History).

network effects from its large community of users. In summary, at the time of the *Cable Modem Order*, ISPs played a much more prominent role in the user's "Internet experience."

Thus, it is not surprising to find that the *Cable Modem Order* describes an environment where the relationship between edge providers and end users was moderated by an ISP. In a discussion of cable modem service, the *Cable Modem Order* offers a description of the market which is strongly colored by the prevalence of that ISP role:

> Cable operators often include in their cable modem service offerings all of the services typically provided by *Internet access providers*, so that subscribers usually do not need to contract separately with another *Internet access provider* to obtain discrete services or applications, such as an email account or connectivity to the Internet, including access to the World Wide Web.[239]

In a footnote to that paragraph, the *Cable Modem Order* notes that "Internet access providers" are also "referred to as ISPs," citing to a 1999 FCC *Order* in support.[240] Clearly, in the view of *Cable Modem Order*, an ISP is a necessary intermediary between an end-user and Internet content and services. However, cable modem (or other broadband services) are no longer viewed by consumers as necessary intermediaries for their online activities.

1. In 2017, broadband providers sell bandwidth (i.e., telecommunications)

Broadband Internet access has been transformed—today broadband providers deliver *telecommunications* that enables end users to reach edge providers. No longer do consumers

[239] *Cable Modem Order,* ¶11, emphasis added.

[240] That the ISPs that the *Cable Modem Order* is referring are of the dial-up variety is clear from the reading of the supporting 1999 reference:

> "An ISP is an entity that provides its customers with the ability to obtain a variety of on-line information through the Internet. *However, ISPs typically own no telecommunications facilities.* In order to provide those components of Internet access services that involve information transport, ISPs lease lines, and otherwise acquire telecommunications, from telecommunications providers. . . Thus, the information service is provisioned by the ISP 'via telecommunications' including interexchange telecommunications although the Internet service itself is an 'information service' under section 3(2) of the Act, rather than a telecommunications service."

Cable Modem Order, ¶11, footnote 43, citing to in re *Deployment of Wireline Services Offering Advanced Telecommunications Capability* CC Docket No. 98-147, Order on Remand, 15 FCC Rcd 385 ¶ 34.

need a proprietary software portal to reach the Internet content and services of their choice. Indeed, a review of broadband provider products finds that the predominant service offering is nothing more than *upload and download speed*. Verizon's FiOS advertising message is typical "Unreal Speed: Stream, download, upload, game, share, connect faster than ever before with FiOS Quantum Internet. Do what you want online, right now."[241] Verizon continues:

> Well, bandwidth is about getting everything you want to watch, listen to, learn and enjoy into your home in the simplest, fastest way possible. . . . So unless you want to spend a lot of time staring at this [image of buffering symbol], or this [image of download progress bar], your bandwidth had better be as wide as you need. And that's exactly what you get with Verizon Fios Internet."[242]

Similarly, Comcast informs its customers "What download speed is right for you? Indulge in super speed and have a great online experience, whether you're browsing the Web, shopping, or streaming your favorite movies and shows."[243] AT&T tells its customers "AT&T Internet service is built to handle whatever users throw at it. It holds up under hours of streaming, mega bites of downloads, and dozens of page refreshes."[244] Regarding its offering, Spectrum states:

> The Fastest Internet Speeds: Spectrum Internet offers the fastest Internet speeds you can get. Stream video, play online games, download music, upload photos and more across multiple devices in your home without sacrificing performance.[245]

These statements clearly describe an offering of "transmission, between or among points specified by the user, of information of the user's choosing, without change in the form or content of the information as sent and received."

[241] http://archive.is/f9Rzh

[242] http://fios.verizon.com/bandwidth.html
[243] https://www.xfinity.com/learn/internet-service/speed
[244] https://www.attsavings.com/internet-plans/internet-75
[245] https://www.spectrum.com/internet.html

2. Non-bandwidth ISP services have faded

Technological change has transformed the relationship between end-user and the content and services that they demand. The capabilities of technology at the network edge have dramatically advanced—ISPs are no long necessary intermediaries between end-users and content and services. Today, e-mail is primarily provided by third parties,[246] and Verizon recently abandoned the provisioning of e-mail to its customers through the "Verizon.net" service.[247] Web hosting is competitively provided, with U.S. broadband providers not even making the top 10 of U.S. web hosting services;[248] furthermore, many end-users' "web presence" is now associated with third party applications such as Facebook and Twitter.

The fact that a broadband provider may today offer content, e-mail, or web hosting does not imply that the customer will use the information services offered by the broadband provider any more than the consumer will utilize the proprietary television and video services offered by the broadband provider. As a result, the broadband service that consumers rely on primarily today is *pure transmission* between their devices and remote computing resources or content of their choice. For example, the rise of over-the-top video, which now makes up over 70% of peak downstream traffic[249] clearly illustrates broadband providers supply of *telecommunications.* Video service providers like Netflix, Hulu, Google, and other over-the-top video sources result in a relationship where both the video service provider and end user view the broadband Internet

[246] See "Gmail Opens Increase 243%; Android Drops Back to #4," Litmus, February 7, 2014, which identifies at least 86% of e-mail opens being associated with Gmail, Outlook.com, Yahoo, and AOL. https://litmus.com/blog/gmail-opens-increase-android-drops-january-email-client-market-share
[247] "Verizon Dropping Its Email Business: Will allow subs to keep email address using Verizon-owned AOL Mail, or pivot to another email provider," *Multichannel News,* March 16, 2017. http://www.multichannel.com/news/finance/verizon-dropping-its-email-business/411568
[248] According to data from ICANN. Furthermore, the 10th largest U.S. based web hosting entity has a market share of 1.13%. https://webhosting.info/domain-registrar-statistics/country/USA
[249] Sandvine, "Global Internet Phenomena Report," 2016. https://www.sandvine.com/downloads/general/global-internet-phenomena/2016/global-internet-phenomena-report-latin-america-and-north-america.pdf

access service as nothing more than pure transmission. A similar relationship results from streaming audio or over-the-top voice. This transformation in the relationship between consumers and Internet services supports the proposition that reclassifying broadband Internet access as an information service would be an inappropriate step backward.

3. DNS and caching do not make broadband Internet access an information service

The *2017 NPRM* also questions the *2015 Title II Order's* views on the impact of domain name services (DNS) and caching, and asks how broadband Internet access service would work without DNS or caching.[250] Presumably, the *2017 NPRM* means to ask how broadband Internet access service would function if the DNS or caching service was not provided by the broadband ISP, as both caching and DNS are competitively available. DNS is no longer exclusively provided by broadband providers—consumers regularly utilize third-party DNS services to improve their Internet experience.[251] Similarly, caching services are available from providers such as Akamai, Limelight, and Level 3.[252] Certainly, the provision of DNS and caching benefits end users, but these services are entirely separable from broadband Internet access services.

4. Regarding caching, ISP discrimination can adversely impact consumers and competition

The *2017 NPRM* asks, with regard to caching, whether "broadband Internet users that now expect high-quality video streaming see only incidental changes or more fundamental changes?"

[250] *2017 NPRM*, ¶37.
[251] See, for example, "4 Reasons Why Using Third-Party DNS Servers Is More Secure," *MUO*, April 17, 2017. http://www.makeuseof.com/tag/reasons-third-party-dns-servers-secure/; see also, "7 reasons to use a third-party DNS service," How-to-Geek, October 22, 2014. http://www.howtogeek.com/167239/7-reasons-to-use-a-third-party-dns-service/ ; see also, "Set Up Third Party DNS for Faster and More Secure Surfing," http://www.practicallynetworked.com/howto/third_party_dns_servers_howto.htm
[252] See for example, https://developer.akamai.com/learn/Caching/Content_Caching.html ; https://www.limelight.com/content-delivery-network/ ; http://www.level3.com/en/products/content-delivery-network/

The answer to that question depends in large part on the behavior of broadband ISPs with respect to providers of third-party content delivery and caching services. The 2013/2014 Netflix experience with Comcast provides a good example. To improve the performance of Netflix's customers, that company has established relationships with CDNs, which can cache content closer to Netflix customers. Netflix has told this Commission that edge providers like Comcast have created artificial congestion on connections from those CDNs to Comcast's network, with Comcast demanding additional payment to relieve the congestion that affects the performance of Comcast's broadband Internet access customers when they utilize Netflix service (as opposed to other non-Netflix services). Netflix describes the experience of its CDN Level 3 Communications with Comcast as follows:

> Approximately one week after Netflix's agreement with Level 3 went into effect, Comcast demanded a new terminating access fee from Level 3 to accept traffic on its network even though—as in every other similar case—that traffic was requested by Comcast' s customers, who paid Comcast a premium for high speed broadband. According to Level 3, this was "the first time [that Comcast demanded] a recurring fee from Level 3 to transmit Internet online movies and other content to Comcast's customers who request such content."
>
> As happened during the Akamai-Comcast and Limelight-Comcast congestion episodes, consumers on Comcast's network experienced poor Netflix streaming quality during the pendency of the congestion. After three days of heavy congestion at interconnection points between Comcast and Level 3's networks, Level 3 agreed to pay the new requested fee for terminating traffic on Comcast's network.[253]

Thus, should a broadband ISP discriminate against third-party caching services, it certainly is possible that consumers will be harmed. Netflix's experience illustrates why it is important for this Commission to maintain Title II authority over broadband Internet access services, including

[253] *In the Matter of Applications of Comcast Corp. and Time Warner Cable Inc. for Consent to Transfer Control of Licenses and Authorizations*, MB Docket No. 14-57, Petition to Deny of Netflix, Inc., August 25, 2014, Declaration of Ken Florance, ¶¶37-38. https://ecfsapi.fcc.gov/file/7521819696.pdf

the potential for case-by-case review of traffic exchange arrangements between broadband ISPs and interconnecting carriers.[254]

5. Edge providers and end-users have become harder to distinguish

The distinction between "customer" and "edge provider" has become more fluid. At the time of the *Cable Modem Order*, the dominant use of the Internet was predominantly the "client/server" model. Web browsing, is the classic example of client/server—end users (clients) access web sites that are provided by remote computers (servers). With client/server, end users download much more than they upload. At the time of the *Cable Modem Order,* user-generated content was in its infancy. Facebook was founded in 2004,[255] two years following the *Cable Modem Order*. YouTube did not launch until 2005,[256] three years after the *Cable Modem Order*. BitTorrent, a peer-to-peer technology that enables the efficient sharing of large files, was developed in 2001, but could not reach its full potential until the mid-2000s, precisely because the number of broadband subscribers, with their improved ability to upload and download information, had yet to reach a critical mass.[257] Thus, when the *Cable Modem Order* was issued, the Internet was still oriented toward the client/server model, where end-users downloaded the information that they wanted, and did relatively little uploading of information that they had produced.

Today, Internet users are also edge providers. By uploading videos, maintaining a Facebook or LinkedIn page, blogging, and gaming, Internet "users" seamlessly slip between the role of

[254] *2015 Title II Order*, ¶203.
[255] http://en.wikipedia.org/wiki/Facebook
[256] http://en.wikipedia.org/wiki/YouTube
[257] And once that critical mass was reached, the Commission quickly discovered that that legal technology was being undermined by a broadband provider. See, *In the Matters of Formal Complaint of Free Press and Public Knowledge Against Comcast Corporation for Secretly Degrading Peer-to-Peer Applications; Broadband Industry Practices Petition of Free Press et al. for Declaratory Ruling that Degrading an Internet Application Violates the FCC's Internet Policy Statement and Does Not Meet an Exception for "Reasonable Network Management"*, File No. EB-08-IH-1518 WC Docket No. 07-52, Memorandum Opinion and Order, August 20, 2008.

consumer of Internet content and services and producer of Internet content and services. Because of the growing production of content by many end users, the proportion of pure "end users" is shrinking, and the number of "edge providers" is growing. This growth has increased the demand for pure transmission capability, a fact recognized by ISPs, who have increasingly promoted the ability to upload as well as download Google Fiber's $70 per month Gigabit service delivers symmetrical speeds.[258] AT&T's "Gigapower" services also provide symmetrical speeds,[259] and Verizon also provides symmetrical broadband to its customers, and recognizes the growing importance of symmetrical speeds (see Figure 9).[260] CableLabs has updated DOCSIS 3.1 to a "full duplex" technology that will support symmetrical speeds.[261]

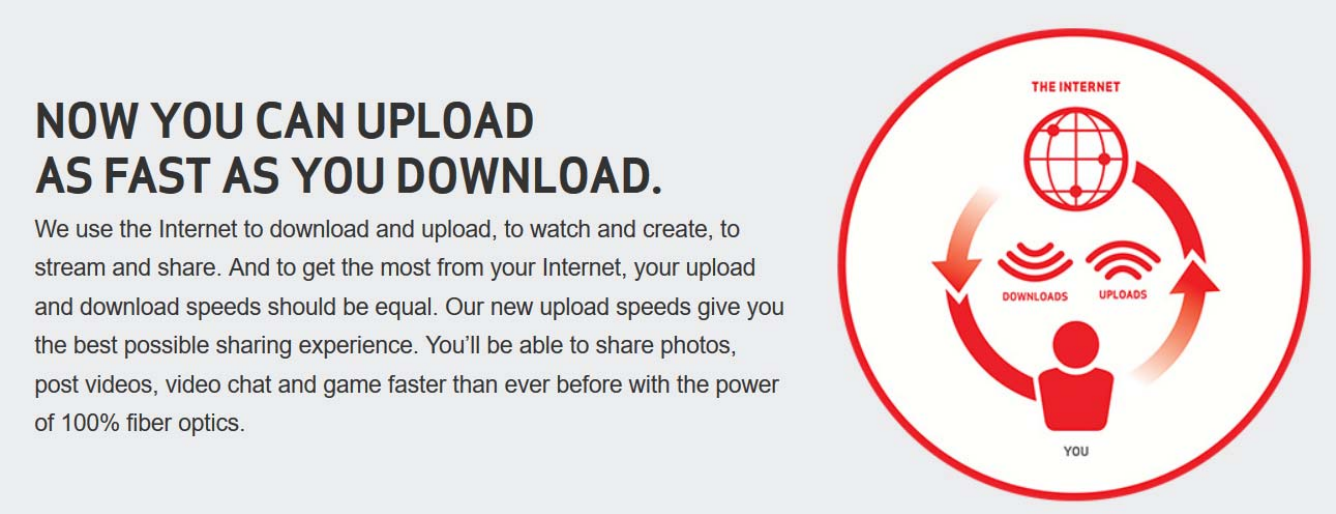

Figure 9: Verizon description of the importance of upload speeds

[258] See, for example, https://fiber.google.com/cities/atlanta/
[259] https://www.att.net/speedtiers
[260] http://campaign.verizon.com/fasterspeeds/?CMP=DMC-CVZ_ZZ_FD_Z_DO_N_X00002
[261] "Comcast: Symmetrical Cable Broadband Coming in Next 24 Months," *DSL Reports*, March 06, 2017. http://www.dslreports.com/shownews/Comcast-Symmetrical-Cable-Broadband-Coming-in-Next-24-Months-139090

Upstream		Downstream		Aggregate	
BitTorrent	18.37%	Netflix	35.15%	Netflix	32.72%
YouTube	13.13%	YouTube	17.53%	YouTube	17.31%
Netflix	10.33%	Amazon Video	4.26%	HTTP - OTHER	4.14%
SSL - OTHER	8.55%	HTTP - OTHER	4.19%	Amazon Video	3.96%
Google Cloud	6.98%	iTunes	2.91%	SSL - OTHER	3.12%
iCloud	5.98%	Hulu	2.68%	BitTorrent	2.85%
HTTP - OTHER	3.70%	SSL - OTHER	2.53%	iTunes	2.67%
Facebook	3.04%	Xbox One Games Download	2.18%	Hulu	2.47%
FaceTime	2.50%	Facebook	1.89%	Xbox One Games Download	2.15%
Skype	1.75%	BitTorrent	1.73%	Facebook	2.01%
	69.32%		74.33%		72.72%

sandvine

Figure 10: Peak Period Fixed Access Applications

Rank	Upstream	2016	Downstream		Aggregate	Share
1	Facebook	14.85%	YouTube	20.87%	YouTube	19.16%
2	SSL - OTHER	14.02%	Facebook	13.97%	Facebook	14.07%
3	Google Cloud	9.28%	HTTP - OTHER	9.36%	HTTP - OTHER	9.32%
4	HTTP - OTHER	8.92%	SSL - OTHER	6.85%	SSL - OTHER	7.62%
5	YouTube	5.01%	Instagram	6.66%	Instagram	6.31%
6	Snapchat	4.36%	Snapchat	5.17%	Snapchat	5.09%
7	Instagram	3.35%	Netflix	3.72%	Google Cloud	3.56%
8	BitTorrent	2.16%	iTunes	3.02%	Netflix	3.41%
9	FaceTime	1.97%	Google Cloud	2.87%	iTunes	2.86%
10	iCloud	1.82%	MPEG - OTHER	2.37%	MPEG - OTHER	2.17%
		65.76%		74.87%		73.57%

sandvine

Figure 11: Peak Period Mobile Access Applications

Data from Sandvine for 2016 classifies and associates upstream and downstream applications and services demanded by consumers. This data clearly illustrates the transformation in the use of upstream Internet resources.[262]

[262] Sandvine, "2016 Global Internet Phenomena: Latin America and North America." https://www.sandvine.com/downloads/general/global-internet-phenomena/2016/global-internet-phenomena-report-latin-america-and-north-america.pdf

Figures 10 and 11 show that upstream traffic is dominated by non-client/server activities such as file sharing, real-time entertainment, and storage (accounting for about 70 percent of peak-period traffic upstream traffic on fixed networks, and about 66% of peak-period traffic on mobile networks). On both fixed and mobile networks, downstream traffic is predominantly real-time entertainment and social media, which also illustrates the predominant telecommunications characteristic of today's broadband connections. At the time of the *Cable Modem Order,* the prevalent client/server activity was web browsing. However, by 2016, web browsing makes up only 3.7%% of upstream, and 4.19% of downstream traffic on fixed broadband networks, and 8.92%% of upstream, and 9.36% of downstream traffic on mobile broadband networks.

The technology setting that inspired the *Cable Modem Order* clearly no longer exists and the ensuing technological transformation has minimized the role of information services offered by broadband providers. Instead, broadband markets are characterized by the supply and demand of the pure telecommunications needed to send and receive the content and services of the "producer/consumer's" choice. The transformation that has occurred since the *Cable Modem Order* was issued provides strong evidence of the continuing appropriateness of Title II classification of broadband Internet access services.

6. Information services and transmission services are "two separate things"

The *2017 NPRM,* when considering whether broadband Internet access delivers an information service or a telecommunications service, states that "there is little reason to think consumers might want a fast or reliable 'transmission . . . of information' but not a fast or reliable 'capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information.'"[263] Certainly, there is reason to think that consumers view these

[263] *2017 NPRM,* ¶36.

matters separately. Consumers demand bandwidth from their broadband ISP to enable access to a variety of applications, based on their own needs and preferences for bandwidth. Consumers' choices of information services, and their quality and performance, are separate choices based on separate preferences. To quote Justice Scalia's dissent in the *Brand X* case:

> Despite the Court's mighty labors to prove otherwise, . . . the telecommunications component of cable-modem service retains such ample independent identity that it must be regarded as being on offer—especially when seen from the perspective of the consumer or the end user, which the Court purports to find determinative. . . . The Commission's ruling began by noting that cable-modem service provides both "high-speed access to the Internet" *and* other "applications and functions,". . ., because that is exactly how any reasonable consumer would perceive it: as consisting of two separate things.[264]

The perception by consumers that broadband Internet access is two separate things is still valid, and the fact that most consumers have turned to third parties for to meet their information service needs emphasizes the separateness. Consumers can expect fast and reliable transmission of information, and separately expect fast and reliable information processing, as provided by entities other than their broadband ISP. And this is exactly what consumers expect. Consumers have tools available, such as bandwidth testing meters, that enable them to understand what download speeds their service provider delivers.[265] Consumers also have choices over which provider of information services to utilize, based on the cost and performance of an information service provider's offerings. While choices of information services are generally numerous, unfortunately for consumers, their ability to choose an alternative broadband provider is very limited.

[264] *National Cable & Telecommunications Assn. v. Brand X Internet Services* (04-277) 545 U.S. 967 (2005) 345 F.3d 1120, reversed and remanded. Dissent of Justice Scalia, citations omitted, emphasis in the original.
[265] See, for example: http://www.speedtest.net/

In summary on the matter of the nature of consumers' use of broadband Internet access services, there is no question that the views contained in the *Cable Modem Order* are no longer a reasonable assessment of how customers use the service. Consumers want bandwidth. Broadband ISPs recognize this fact and market bandwidth. Bandwidth does no more than transport information of the user's choosing without change in the form or content of the information as sent and received, it is "telecommunications," as defined by the Communications Act. The classification of broadband Internet access service as a Title II service is appropriate.

D. The *2017 NPRM's* discussion of "points" of communication is unreasonable

The *2017 NPRM* offers an argument to support the proposition that ISPs do not offer "telecommunications" based on the "points" between which information is sent, and on consumer knowledge of sender and receiver locations:

> In contrast, Internet service providers do not appear to offer "telecommunications," i.e., "the transmission, between or among points specified by the user, of information of the user's choosing, without change in the form or content of the information as sent and received," to their users. *For one, broadband Internet users do not typically specify the "points" between and among which information is sent online.* Instead, routing decisions are based on the architecture of the network, not on consumers' instructions, and consumers are often unaware of where online content is stored.[266]

The theory that the user must know each point through which their communication passes for telecommunications to exist is not reasonable and would preclude the existence (at least legally) of any "telecommunications." Perverse results arise when applying the *2017 NPRM's* "points" logic to other services over which there is no dispute as to their classification, such as voice calls. The *2017 NPRM's* "points" logic would suggest that local or long-distance voice calling on the legacy PSTN could not be "telecommunications" as consumers do not know the network

[266] *2017 NPRM,* ¶29, emphasis added.

architecture of the voice network, and thus do not specify each "point" on the network through which the call will pass.

Alternatively, the *2017 NPRM's* suggestion that consumers must know the location of "where online content is stored" for telecommunications to exist also fails. When using the legacy PSTN, the location of a call's recipient is often unknown to the caller. Consumers frequently dial long distance calls having no idea where the called party is located (for example, when using an 800 number to reach a business). Similarly, when dialing a mobility customer's voice number, the caller has no idea of the called party's location. The *2017 NPRM's* "location" theory is incorrect, and the *2017 NPRM's* interpretation of "points" of communication is untenable.

E. The *2017 NPRM's* is incorrect regarding the "offer" of telecommunications

The *2017 NPRM's* "back to the future" view that "Internet service providers do not appear to *offer* 'telecommunications'"[267] was soundly rebutted by 12 years ago by Justice Scalia in his dissent in the *Brand X* case, which is worth quoting at length:

> It seems to me, however, that the analytic problem pertains not really to the meaning of "offer," but to the identity of what is offered. The relevant question is whether the individual components in a package being offered still possess sufficient identity to be described as separate objects of the offer, or whether they have been so changed by their combination with the other components that it is no longer reasonable to describe them in that way.
>
> Thus, I agree . . . that it would be odd to say that a car dealer is in the business of selling steel or carpets because the cars he sells include both steel frames and carpeting. Nor does the water company sell hydrogen, nor the pet store water (though dogs and cats are largely water at the molecular level). But what is sometimes true is not, as the Court seems to assume, *always* true. There are instances in which it is ridiculous to deny that

[267] *2017 NPRM,* ¶29, emphasis added. On the "offer" issue, see also, *2017 NPRM,* ¶¶36, 39, & 65.

> one part of a joint offering is being offered merely because it is not offered on a "stand-alone" basis. . . .
>
> If, for example, I call up a pizzeria and ask whether they offer delivery, both common sense and common "usage,". . . would prevent them from answering: "No, we do not offer delivery—but if you order a pizza from us, we'll bake it for you and then bring it to your house." The logical response to this would be something on the order of, "so, you do offer delivery." But our pizza-man may continue to deny the obvious and explain, paraphrasing the FCC and the Court: "No, even though we bring the pizza to your house, we are not actually 'offering' you delivery, because the delivery that we provide to our end users is 'part and parcel' of our pizzeria-pizza-at-home service and is 'integral to its other capabilities.'". . . Any reasonable customer would conclude at that point that his interlocutor was either crazy or following some too-clever-by-half legal advice.
>
> . . .
>
> Despite the Court's mighty labors to prove otherwise, . . . the telecommunications component of cable-modem service retains such ample independent identity that it must be regarded as being on offer. . .[268]

The "ample independence" to which Justice Scalia refers is with us still. As illustrated in the discussion of broadband ISP marketing, bandwidth is the product that is bought and sold in broadband markets. Consumers want the capability to *send and receive* information of their choosing to and from YouTube and Facebook and millions of other sites. They want to download and stream videos from Hulu, Netflix, Amazon, and other sources of video. Bandwidth is what matters to consumers of broadband Internet access service, and as noted elsewhere in these comments,[269] broadband ISPs know this very well: "bandwidth is about getting everything you want to watch, listen to, learn and enjoy into your home in the simplest, fastest way possible. . . . And that's exactly what you get with Verizon Fios Internet."[270] There is no doubt that the "offer" remains just a Justice Scalia described.

[268] *National Cable & Telecommunications Assn. v. Brand X Internet Services* (04-277) 545 U.S. 967 (2005) 345 F.3d 1120, reversed and remanded. Dissent of Justice Scalia.
[269] See, generally, the discussion in Section VII. C.
[270] http://fios.verizon.com/bandwidth.html

F. The 1998 *Stevens Report* is not controlling

The *2017 NPRM* also cites the 1998 *Stevens Report* as an authority regarding the appropriate classification of broadband Internet access services.[271] As might be expected, the perspective of the *Stevens Report*, written in the pre-broadband year of 1998, does not capture the transformation of Internet access that has occurred since. As discussed above,[272] broadband technology promoted a robust and full-service network edge, eliminating the need for the portal provided by ISPs in the dial-up world. Furthermore, the *2017 NPRM* is very selective in its reading of the *Stevens Report*, as that report clearly illustrates the separate offer of telecommunications implicit in Internet access services. For example, the *Steven Report* describes the Internet architecture of the period and makes it clear that consumers generally did not get either dial-up or broadband Internet access from their Internet service provider, rather, a separate common carrier provided the needed access service:

> *End users obtain access to and send information either through dial-up connections over the public switched telephone network, or through dedicated data circuits over wireline, wireless, cable, or satellite networks.* Access providers, more commonly known as Internet service providers, combine computer processing, information storage, protocol conversion, and routing with transmission to enable users to access Internet content and services. Major Internet access providers include America Online, AT&T WorldNet, Netcom, Earthlink, and the Microsoft Network. . . .[273]

Thus, when the *Stevens Report* concludes that "Internet access providers" do not offer telecommunications service to their customers,[274] that conclusion was based on the fact that last-mile dial-up and broadband networks separately provided the needed telecommunications. Of course, at the time of the *Stevens Report,* the services needed to reach one's ISP were governed

[271] *2017 NPRM,* ¶29.
[272] Section VII. C.
[273] *In the Matter of Federal-State Joint Board on Universal Service, Report to Congress*, CC Docket No. 96-45, April 10, 1998¶63, emphasis added. Hereinafter, *Stevens Report*.
[274] *Stevens Report*, ¶83.

under Title II.[275] This situation has not changed. Today, broadband ISPs provide telecommunications that enable the use of information services, which are overwhelming provided by third parties.[276] As such, continued classification of broadband Internet access service under Title II is both sensible and consistent with the *Stevens Report.*

G. Clarity is hard to find in the 1996 Telecommunications Act

The *2017 NPRM* also seeks comment on a variety of statutory provisions, including those imposed by the *1996 Telecommunications Act.* The *2017 NPRM* cites a 1998 letter from *Five Senators* to the FCC that states, in part, "nothing in the 1996 Act or its legislative history suggest that Congress intended to alter the current classification of Internet and other information services or to expand traditional telephone regulation to new and advanced services."[277] Of course, the *Five Senators* letter is subject to a perspective similar to the *Stevens Report*, as at the time of its writing, both dial-up and broadband Internet access services were reached by consumers using telecommunications facilities governed by Title II. The *Five Senators* letter does not suggest in any way that the dial-up or broadband access services should be classified as Title I information services.[278]

While the *2017 NPRM* seeks clarification from the 1996 Telecommunications Act on the classification matter, finding clarity in the 1996 Act is a daunting task. As was noted by the late

[275] Which the *Stevens Report* indicated would be a continuing source of funding for universal service purposes. *Stevens Report*, ¶66. The *Stevens Report* also observed that for those few ISPs that owned access facilities, they were not then assessed for universal service purposes. The *Stevens Report* saw this as a problem: "We believe it is appropriate to reexamine that result. One could argue that in such a case the Internet service provider is furnishing raw transmission capacity to itself." *Stevens Report*, ¶69.
[276] Yes, dial-up ISPs still exist. See, for example, https://www.earthlink.net/dialup/
[277] *2017 NPRM,* ¶34, citing to March 23, 1998 from John Ashcroft, Randell Tate, John Kerry, Spencer Abraham, and Ron Wyden to William Kennard. Hereinafter *Five Senators* letter.
[278] The focus of the *Five Senators* letter is the assessment of universal service support, and while that letter does encourage the FCC to refrain from imposing universal service assessments on Internet services providers, the letter does not suggest that the existing telecommunications services used to reach ISPs should be either exempted from universal service contributions, or reclassified as Title I.

Supreme Court Justice Anton Scalia, "It would be gross understatement to say that the 1996 Act is not a model of clarity. It is in many important respects a model of ambiguity or indeed even self-contradiction."[279] However, it is clear that portions of the 1996 Act are consistent with the idea that broadband is telecommunications. One need look no further than Section 706 of the 1996 Act, with its language regarding the nature of "advanced telecommunications capability":

> ADVANCED TELECOMMUNICATIONS CAPABILITY- The term `advanced telecommunications capability' is defined, without regard to any transmission media or technology, as high-speed, switched, *broadband telecommunications capability that enables users to originate and receive high-quality voice, data, graphics, and video telecommunications using any technology*.[280]

Here the 1996 Act clearly describes what broadband does, and indicates that this broadband capability is "telecommunications." Section 706 elsewhere instructs the Commission to ensure that all Americans have access to this technology by means of "price cap regulation, *regulatory forbearance*, measures that promote competition in the local telecommunications market, or *other regulating methods that remove barriers to infrastructure investment*."[281] The *2015 Title II Order* is consistent with both the description of broadband telecommunications, and the suggested regulatory mechanisms to achieve the 1996 Act's stated objectives of making advanced telecommunications available to all Americans.[282]

H. The Modification of Final Judgement foresaw the danger of integrated access/service providers

The *2017 NPRM* also seeks comment on whether the court associated with the 1982 Modification of Final (MFJ) thought that Internet access service was a telecommunications

[279] 525 U.S. 366 (1999) *AT&T Corp. et al. v. Iowa Utilities Board et al.* No. 97-826. United States Supreme Court. January 25, 1999. 397.
[280] 47 U.S. Code § 1302(d)(1) - Advanced telecommunications incentives, Emphasis added.
[281] *Id,* emphasis added.
[282] See, *2015 Title II Order,* ¶110.

service.[283] Internet access services are not mentioned in the consent decree document, or in the District Court ruling.[284] This omission is not surprising, as mass-market commercial Internet access services did not emerge until the mid-1990s. However, the MFJ did address information services, and it was clear by the terms of the MFJ that those could not be provided by the newly-formed Regional Bell Operating Companies (RBOCs).[285] The explanation of the District Court, was written long before the network neutrality issue emerged. However, it raises familiar themes regarding the potential for firms that have market power in the provision of the network access services needed to reach information service providers to harm competition, consumers, and innovation. Notably, the District Court foresaw the need to control monopoly power and discrimination:

> All information services are provided directly via the telecommunications network. *The Operating Companies would therefore have the same incentives and the same ability to discriminate against competing information service providers that they would have with respect to competing interexchange carriers. Here, too, the Operating Companies could discriminate by providing more favorable access to the local network for their own information services than to the information services provided by competitors*, and here, too, they would be able to subsidize the prices of their services with revenues from the local exchange monopoly.[286]

The District Court also anticipated the appropriateness of preventing access providers from discriminating in the design of their networks, thus anticipating the need for transparency rules:

[283] *2017 NPRM,* ¶41.
[284] Modification of Final Judgement, August 24, 1982, passim; *United States v. American Tel. and Tel. Co.*, 552 F. Supp. 131 (D.D.C. 1983), passim.
[285] The definition of "information services" contained in the MFJ is virtually identical to that codified in the 1996 Telecommunications Act: "'Information service' means the offering of a capability for generating, acquiring, storing, transforming, processing, retrieving, utilizing, or making available information which may be conveyed via telecommunications, except that such service does not include any use of any such capability for the management, control, or operation of a telecommunications system or the management of a telecommunications service." MFJ, p. 8.
http://web.archive.org/web/20060830041121/http://members.cox.net/hwilkerson/documents/AT&T_Consent_Decree.pdf
[286] *United States v. American Tel. and Tel. Co.*, 552 F. Supp. 131 (D.D.C. 1983), 189, emphasis added.

> There is also the effect on the configuration of the local networks to consider. Many of the competitive problems in the interexchange market resulted from the fact that competition was introduced after AT&T had designed the local networks to service only its own Long Lines department. If the Operating Companies are excluded from the information services market, they will have an incentive, as time goes on, to design their local networks to accommodate the maximum number of information service providers, since the greater the number of carriers the greater will be the Operating Companies' earnings from access fees. Thus, competition will be encouraged from the outset. *If, however, the Operating Companies were permitted to provide their own information services, their incentive would be the precise opposite: it would be to design their local networks to discourage competitors, and thus to thwart the development of a healthy, competitive market.*[287]

Furthermore, the District Court addressed the willingness of service providers to invest in next generation technologies to satisfy customer needs for advanced services:

> The restriction on the provision of information services by the Operating Companies has been attacked on the ground that it will remove their incentive to upgrade the local networks and will cause them to become technological backwaters. This claim underrates the role of the Operating Companies under the proposed decree. *These companies will carry traffic between the information service providers and their subscribers; their networks will therefore have to be capable of carrying these technologically advanced services; and they will have a financial incentive to create this capability because they will earn access charges for providing this service*.[288]

These observations from the District Court 35 years ago are equally cogent today. As the District Court projected, the joint provision of the telecommunications component with information services has provided incentives for discrimination.[289] The *2015 Title II Order,* and the associated open Internet rules are consistent with the vision of the MFJ Court.

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[287] *United States v. American Tel. and Tel. Co.*, 552 F. Supp. 131 (D.D.C. 1983), 189-190, emphasis added.
[288] *United States v. American Tel. and Tel. Co.*, 552 F. Supp. 131 (D.D.C. 1983), 190, emphasis added.
[289] See, for example, *In the Matters of Formal Complaint of Free Press and Public Knowledge Against Comcast Corporation for Secretly Degrading Peer-to-Peer Applications Broadband Industry Practices, Petition of Free Press et al. for Declaratory Ruling that Degrading an Internet Application Violates the FCC's Internet Policy Statement and Does Not Meet an Exception for "Reasonable Network Management"*, File No. EB-08-IH-1518, WC Docket No. 07-52. Memorandum and Order, August 20, 2008. See also, *In the Matter of Applications of Comcast Corp. and Time Warner Cable Inc. for Consent to Transfer Control of Licenses and Authorizations*, MB Docket No. 14-57 Petition to Deny of Netflix, Inc. August 25, 2014, pp. 52-68. See also, "AT&T lifts FaceTime restrictions on Apple iPhones," Washington Post, November 8, 2012, https://www.washingtonpost.com/blogs/post-

I. Any cost-benefit analysis must address edge innovation and the "virtuous circle"

As the *2017 NPRM* proposes to perform a "cost-benefit" analysis associated with Title II classification, as well as specific rules,[290] it will be critical for the Commission to fully address all benefits associated with the openness of the Internet, especially those flowing to consumers from the network's edge, as illustrated with the virtuous circle argument discussed above. While these benefits are unquestionably substantial, they may be difficult to quantify. For example, quantifying the benefits of an invention like HTTP may be challenging, even though it is obvious that the benefits are substantial. These benefits of edge innovation should be considered. As noted in Executive Order 12866, the Commission should evaluate "qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider."[291] The benefits that edge innovation has delivered to consumers are undoubted substantial. Open Internet principle have encouraged the most significant telecommunications technology transition ever experienced by consumers, and these benefits deserve a full accounting. AARP urges the Commission to assess the benefits of edge innovation broadly. Furthermore, as Executive Order 13563 explained, when considering regulatory options the Commission should:

> ". . . propose or adopt a regulation only upon a reasoned determination that its benefits justify its costs (*recognizing that some benefits and costs are difficult to quantify*); . . . and select, in choosing among alternative regulatory approaches, those approaches that maximize net benefits (*including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity*). . . ."[292]

tech/post/atandt-lifts-facetime-restrictions-on-apple-iphones/2012/11/08/cbec36de-29de-11e2-b4e0-346287b7e56c_blog.html?utm_term=.c94cab666cd1 . See also,

[290] *2017 NPRM*, ¶105-115.

[291] Executive Order 12866, p. 1. http://www.archives.gov/federal-register/executive-orders/pdf/12866.pdf

[292] Executive Order 13563, p. 1, emphasis added. http://www.gpo.gov/fdsys/pkg/FR-2011-01-21/pdf/2011-1385.pdf

There is no question that the edge innovation has monumental economic, environmental, public health and safety benefits, as well as impacts on distribution and equity. Any cost/benefit analysis pursued by the Commission should include a broad evaluation of costs and benefits.

VIII. Conclusion

For the reasons discussed in these comments, AARP strongly urges the Commission to maintain the classification of broadband Internet access services under Title II, and to maintain the regulatory framework contained in the *2015 Title II Order*. Returning to Title I all but assures that the Commission will not be able to support "Internet freedoms." Instead of protecting Internet freedoms, Title I classification will result in the Commission picking winners in the Internet ecosystem, and those winners will be broadband ISPs. Because of continuing market power in broadband markets, with the overwhelming majority of consumers facing wireline duopolies or monopolies, and edge providers facing terminating monopolies, the abandonment of Title II will result in the Commission tipping the balance in favor of broadband ISPs, who have the potential and incentives to become "gatekeepers" who will disrupt the virtuous circle of investment and innovation. The disruption of investment and innovation will harm economic activity, social communication, and the future of the broadband Internet, the most important telecommunications technology platform that has ever been created.

Appendix: Evaluation of the *Ford Counterfactual* paper

The *2017 NPRM* references the *Ford Counterfactual* white paper,[293] which purports to show that the mere threat of reclassification of broadband Internet access to Title II resulted in a reduction in "telecommunications investment" of $160 to $200 billion between 2011 and 2015.[294] Just prior to the issuance of the *2017 NPRM*, Dr. Ford updated his research with a paper titled "Net Neutrality, Reclassification and Investment: A Further Analysis,"[295] which is not referenced by the *2017 NPRM*. The second paper applies some alternative assumptions, but reaches the same conclusions as the original paper. The evaluation that follows will primarily focus on the results reported in the original *Ford Counterfactual* paper. Because the problems that are present in the original paper are reproduced in the second, the discussion below applies to both papers. Any reference to the second paper will be to the "*Ford Counterfactual Update*." Neither paper lends any support to the proposition that Title II has had a negative impact on telecommunications investment.

A. The *Ford Counterfactual* does not address investment following the *2015 Title II Order*

It is first important to note that the *Ford Counterfactual* paper does not attempt to draw conclusions regarding the impact of Title II reclassification arising from the *2015 Title II Order* on broadband investment. Instead, the *Ford Counterfactual* paper focuses its analysis on investment during the period 2011-2015. It is the premise of the *Ford Counterfactual* paper that statements made in 2010 by FCC Chairman Julius Genachowski regarding potential Title II reclassification led to declining telecommunications investment during the 2011-2015 period, a

[293] *2017 NPRM*,¶45, referencing "Net Neutrality, Reclassification and Investment: A Counterfactual Analysis," Dr. George S. Ford, April 25, 2017. http://www.phoenix-center.org/perspectives/Perspective17-02Final.pdf (Hereinafter, *Ford Counterfactual*).
[294] *Ford Counterfactual,* p. 6. As will be discussed below, the *Ford Counterfactual* does not study investment in broadband, but is a conglomeration of broadcasting and telecommunications firms.
[295] Hereinafter, *Ford Counterfactual Update.* http://www.phoenix-center.org/perspectives/Perspective17-03Final.pdf

period in which broadband Internet access remained under Title I.[296] So, the *Ford Counterfactual* paper is not about the impact of the *2015 Title II Order*. It is important to note, however, that the *Ford Counterfactual Update* misstates the conclusions of the original *Ford Counterfactual* paper:

> In a recent paper, *Net Neutrality, Reclassification and Investment: A Counterfactual Analysis*, I used the difference-in-differences methodology to estimate the effect on telecommunications investment of the Federal Communications Commission's ("FCC") Net Neutrality policies, including especially the Agency's decision to reclassify broadband as a Title II common carrier telecommunications service.[297]

This is incorrect, the original *Ford Counterfactual* paper does not study the period following the 2015 reclassification. Rather, the *Ford Counterfactual* conducts an analysis that studies investment during a "control" period (1980-2009) and compares that to the period 2011-2015.

B. Ford's Counterfactual

To explain why he has approached the investment issue from a counterfactual perspective, Ford begins with a discussion of warts:

> A simple example illustrates the need for a counterfactual. Say, for instance, a drug has been developed as a treatment for warts. To test its efficacy, the drug is given to a sample of persons with warts and the size of the warts is measured daily. After thirty days, it is determined that the 90% of the warts have vanished. It is tempting to say that the drug has cured the warts, but it is not possible to do so since some warts may vanish on their own. To determine the efficacy of the drug, a counterfactual is needed.
>
> A proper experiment of the drug's efficacy includes a control group of persons with warts, but this group receives a placebo instead of the actual drug. As with the treated group, the size of the warts is monitored. For the control group, it is determined that only 20% of the warts were gone in thirty days (the counterfactual), providing strong evidence that the drug effectively eliminates warts.[298]

[296] *Ford Counterfactual*, p. 2.
[297] *Ford Counterfactual Update,* p. 1, underline emphasis added. Dr. Ford also states in the original *Ford Counterfactual* paper that there is a "delay of two-or-so years" in investment decisions (*Ford Counterfactual*, p. 5). This indicates that data to conduct such analysis does not yet exist.
[298] *Ford Counterfactual,* p. 3.

Thus, the inspiration of Ford's methodology is that of a controlled experiment. However, because Ford cannot conduct an experiment, such as in a wart study, an alternative approach is pursued. In Ford's paper, the analogy of a "treatment" is the "threat" of Title II regulation, which Ford believes emerged in 2010:

> I propose and test the hypothesis that the reclassification "treatment" appropriately starts not with the promulgation of the FCC's 2015 Open Internet Rules, but with the initial shock to the market: that is, the first realistic threat of reclassification by former FCC Chairman Julius Genachowski in 2010.[299]

To examine the impact of Title II on broadband investment, the *Ford Counterfactual* utilizes a statistical approach that evaluates investment trends associated with a proxy for broadband telecommunications investment and investment trends in other industries, during a "pre-treatment" period of 1980-2009, and a "post-treatment" period of 2011-2015.[300]

In addition, Ford utilizes a control group. "This control group establishes the counterfactual, which is the expected level of telecommunications investment absent the threat of Title II reclassification."[301] Ford chooses the following industry sectors for the control group: (A) machinery manufacturing; (B) computer and electronic products manufacturing; (C) plastic and rubber products manufacturing; and (D) transportation and warehousing. As will be discussed further below, the selection of these sectors, which do not have similar characteristics to broadband telecommunications, raises further questions regarding Ford's methodology.

Thus, the basic idea associated with the *Ford Counterfactual's* approach is that, but for the threat of Title II, the observed trend in "telecommunications" investment should follow the same trend

[299] *Ford Counterfactual*, p. 2.
[300] See the "Results" section of the *Ford Counterfactual*, p. 6. "For the full sample (1980-2015, excluding 2010), there are five industry sectors (four controls and telecommunications) and 35 years of data each, so there are 175 total observations. Limiting the analysis to 1990-2015, there are 130 total observations. Finally, considering only data from 2000-2015, there are 75 observations."
[301] *Ford Counterfactual,* p. 5.

as the control group. If there is a divergence in trends, the *Ford Counterfactual* claims it can be associated with the impact of Title II. As discussed below, the *Ford Counterfactual* does not reasonably deliver the promised results.

C. Ford does not focus on broadband telecommunications

The *Ford Counterfactual* fails to reasonably execute the counterfactual methodology. The first error of note is that the *Ford Counterfactual* does not study investment in broadband infrastructure alone, or even in the telecommunications sector. While it is clear that Ford would like to draw conclusions about broadband investment,[302] the *Ford Counterfactual* instead examines the investment levels associated with the "Broadcasting and Telecommunications"[303] industry sector (as defined by the Bureau of Economic Analysis [BEA]).[304]

Table A1: Components of the BEA's "Broadcasting and Telecommunications" sector that is interpreted at telecommunications investment in the *Ford Counterfactual.*

NAICS Code	**Name of Sector**	**NAIC Code**	**Name of Sector**
515111	Radio Networks	517311	Wired Telecommunications Carriers
515112	Radio Stations	517312	Wireless Telecommunications Carrier (except satellite)
515120	Television Broadcasting	517410	Satellite Telecommunications
515210	Cable and Other Subscription Programming	517911	Telecommunications Reseller
		517919	All other Telecommunications

The Broadcasting and Telecommunications sector includes the subsectors shown in Table A1. Thus, when considering investment in "telecommunications," the *Ford Counterfactual*

[302] "Broadband Service Providers are among the nation's largest spenders on capital equipment, and many factors influence their capital outlays including the demand for services, capacity needs and enhancements, and regulatory considerations." *Ford Counterfactual,* p. 2.
[303] *Ford Counterfactual,* p. 5.
[304] *Ford Counterfactual*, p. 5, and footnote 22, which shows the source of "investment" data being BEA fixed asset tables. The BEA utilizes the North American Industry Classification System (NAICS) to categorize industries.

inappropriately includes information from other industries that have no relationship to broadband telecommunications, and which were not affected by FCC Title II regulation in any way. In addition, for the wireline and wireless telecommunications industry that is included, the investment expenditures tracked will include investments other than those associated with broadband Internet access, as these companies provide other services. Thus, even if the other elements of the analysis were to be properly executed, the observed results cannot be associated with decisions made by broadband providers on broadband investment alone.

As a result, at a foundational level, the *Ford Counterfactual* is not tracking changes that could reasonably be associated with the anticipation or "threat" of Title II, rather, many factors in the other sectors captured in the BEA classification, and other services provided by wireline and wireless carriers are also influencing any observed changes. The *Ford Counterfactual* does not reasonably focus on broadband investment.

D. The *Ford Counterfactual* ignores Title II in the "pre-treatment" period

Another overarching and fatal problem with both *Ford Counterfactual* papers results from an oversight on Dr. Ford's part regarding when Title II regulation was governing the telecommunications industry. As a result, the "pre-treatment" period used in the analysis (1980-2009) contains significant periods during which Title II was in effect. Recall that the objective of the *Ford Counterfactual* is to explore the impact of the "threat" of Title II on telecommunications investment in the 2011-2015 period.[305] Dr. Ford indicates that the "threat" of Title II emerged in 2010, however, the *Ford Counterfactual* ignores the fact that during 25 years of the 30-year "pre-treatment" period all telephone company services (including

[305] *Ford Counterfactual,* p. 2.

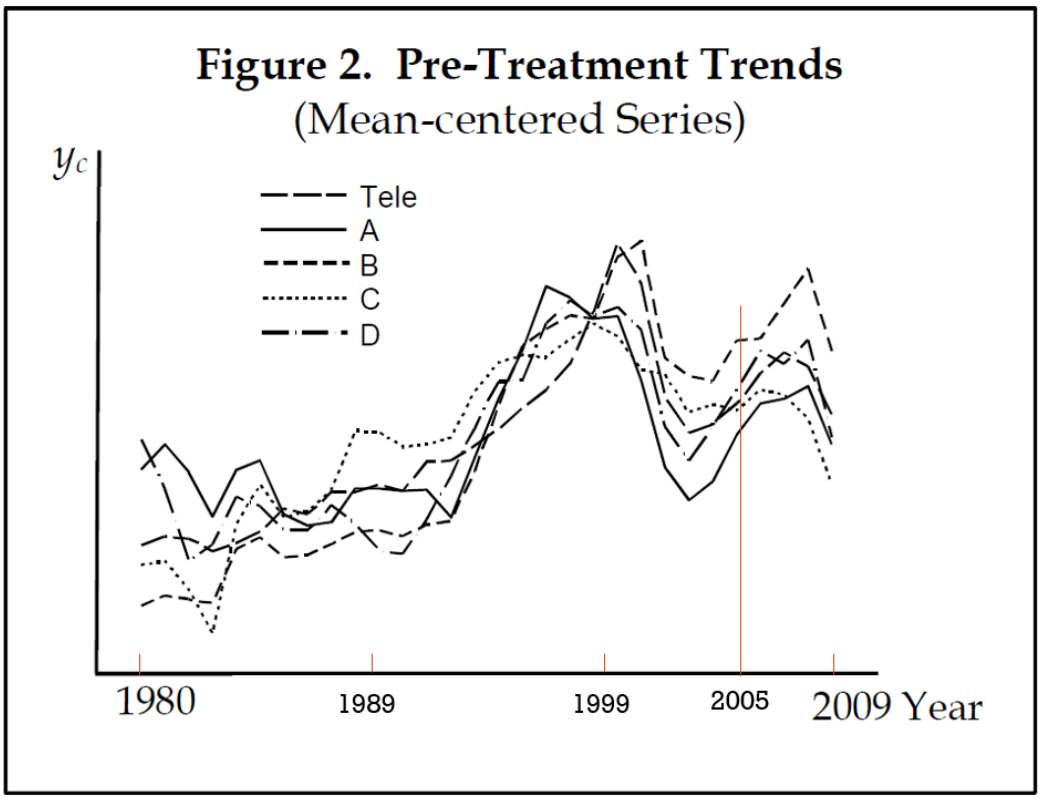
broadband) were subject to Title II.[306] The fact that investment decisions were directly influenced by Title II for the bulk of the "pre-treatment" period is overlooked by Dr. Ford, and this is a fatal flaw in his analysis.

Thus, to whatever extent the data associated with the Broadcasting and Telecommunications sector measures telecommunications investment, the division of the time series into "pre-treatment" and "treatment" periods in the *Ford Counterfactual* is fundamentally flawed. As the overwhelming majority of the "pre-treatment" period incorporates actual Title II regulation of telecommunications providers, investment decisions made by telecommunications providers were directly influenced by Title II during the "pre-treatment" period. In the context of Dr. Ford's "wart study" analogy, the result is similar to a wart treatment being used by most participants in the study before the actual "treatment" beginning. The results of such a study of wart treatments would be distorted and meaningless.

Furthermore, the *Ford Counterfactual* shows that during both the 25 Title II years, and the five Title I years in the pre-treatment period, the "telecommunications" investment that is studied tracks well with the other industries selected by Ford—in other words, there is no impact on investment trends as telephone company broadband shifted in 2005 from Title II to Title I. The figure below is reproduced from the *Ford Counterfactual* paper.[307] In Dr. Ford's Figure 2, "Tele" reflects the BEA Broadcasting and Telecommunications data, and the four other sectors evaluated and compared by Dr. Ford are: (A) machinery manufacturing; (B) computer and electronic products manufacturing; (C) plastic and rubber products manufacturing; and (D)

[306] The pre-treatment period utilized in the *Ford Counterfactual* papers is 1980-2009. It was not until 2005 that telephone company broadband was moved from a Title II classification to Title I.
[307] *Ford Counterfactual,* p. 5. The year markers for 1989, 1999, and 2005 have been added. 2005 is the demarcation between Title II and Title I periods for the "Tele" data shown in the figure.

transportation and warehousing. It is clear from Ford's Figure 2 that the shift from Title II to Title I in 2005 does not disrupt the general conformity with the telecommunications investment trend with the other industries used in Ford's study. The continuity of conformity of trends in the pre-treatment period suggest that regulatory classification has little impact on investment decisions.



E. The *Ford Counterfactual* utilizes a questionable control group

However, there is another problem with the *Ford Counterfactual*. Recall that the analysis compares trends associated with "Broadcasting and Telecommunications" with other sectors of the economy. To choose those other sectors, the *Ford Counterfactual* identifies a control group by correlating investment data between Broadcasting and Telecommunications and other sectors

of the economy.[308] The *Ford Counterfactual* claims that the first cut in the selection of the control group is to identify sectors with "high correlation" to Broadcasting and Telecommunications. A review of the BEA data used in the *Ford Counterfactual*, however, shows that the *Ford Counterfactual* does not consistently choose sectors with high correlation to Broadcasting and Telecommunications. Results of the correlation of Ford's control industries and the Broadcasting and Telecommunications sector are shown in Table A2.

Table A2: Selection correlation values based on BEA Table 3.71ESI. Top 10 sectors by correlation with Broadcasting and Telecommunications. Highlighted rows indicate sectors selected by the *Ford Counterfactual* and *Ford Counterfactual Update.*

Correlation Rank	Category	Correlation
	Broadcasting and telecommunications	1
1	Information	0.97576908
2	Computer and electronic products*	0.968500216
3	Amusements, gambling, and recreation industries	0.960767815
4	Durable goods***	0.960311864
5	Computer systems design and related services	0.952720609
6	Arts, entertainment, and recreation	0.949753763
7	Transportation and warehousing**	0.94669885
8	Manufacturing	0.944276784
9	Finance and insurance	0.921911356
10	Performing arts, spectator sports, museums, and related activities	0.920316442
12	Plastics and rubber products*	0.918544997
23	Machinery*	0.895191536
40	Wholesale trade***	0.847732557

*Used only in the *Ford Counterfactual*.
**Used in both the *Ford Counterfactual* and the *Ford Counterfactual Update.*
***Used only in the *Ford Counterfactual Update*.

[308] *Ford Counterfactual*, p. 5. "In the BEA's data, there are over 70 different economic sectors, narrowly and broadly defined, from which to choose controls. My approach to selecting a control group is based solely on pretreatment investment trends and involves the following methods. First, I narrow the possibilities by computing a simple correlation coefficient (r) between broadcasting and telecommunications investment and the other sectors in the pre-treatment period, looking for relatively high correlation coefficients."

Table A2 shows the results of a correlation analysis for the same data set utilized by the *Ford Counterfactual.*[309] Four of the highlighted rows, "computer and electronic products," "transportation and warehousing," "plastics and rubber products," and "machinery" are the sectors utilized in the initial *Ford Counterfactual.* The *Ford Counterfactual* thus settles on some sectors that have very little structural similarity to Broadcasting and Telecommunications. Industries that produce machinery, plastics and rubber, and transportation and warehousing are not subject to the extreme scale economies associated with broadband telecommunications, nor are they subject to network effects that result in the value of the product depending on the number of users. The *Ford Counterfactual's* selection would be more reasonable if the correlation values were very high, but they are not in all cases, with other sectors overlooked, including some, like "information" and "computer systems design and related services" that have much higher correlation coefficients. The selection of these sectors raise questions regarding the *Ford Counterfactual's* methodology. It is also worth noting that in a May 16, 2017 update to the *Ford Counterfactual*, Dr. Ford offers a revised three-sector analysis, which replaces computer and electronic products, machinery, and plastics and rubber products with two new sectors: durable goods and wholesale trade (leaving in transportation and warehousing). As shown above in Table A2, durable goods have a relatively high correlation value with Broadcasting and Telecommunications, but wholesale trade only generates a correlation coefficient of .8477,

[309] Data in Table A2 is based on a simple correlation coefficient calculation for all BEA sectors for the same "pretreatment" years (1980-2009) utilized in the *Ford Counterfactual.* Data is from BEA Table 3.7ESI "Investment in Private Fixed Assets by Industry," the same data that is used in the *Ford Counterfactual*: https://bea.gov/iTable/iTable.cfm?ReqID=10&step=1#reqid=10&step=3&isuri=1&1003=138&1004=1980&1005=2010&1006=a&1011=0&1010=x

There is a total of 78 industry classifications in BEA Table 3.7ESI, Table 4 shows the ten sectors with the highest correlation with Broadcasting and Telecommunications, and three other categories selected by Dr. Ford. The "Correlation Rank" shows the rank of the industry sector based on a simple correlation study, as compared to Broadcasting and Telecommunications.

certainly not a "relatively high value."[310] The inconsistent correlation values raise questions as to whether the *Ford Counterfactual* was mining the data for industry sectors that would yield the desired trends, rather that industry sectors that are reasonably associated with Broadcasting and Telecommunications.

F. Conclusion: The *Ford Counterfactual* is deeply flawed.

All of the flaws discussed above are associated with both of Dr. Ford's papers, and as a result, the Commission can draw no conclusions from Dr. Ford's work that support the proposition that the *2015 Title II Order* had any negative impact on investment.[311] The Commission should not conclude that Title II has decreased investment based on the Ford studies. On the other hand, as is illustrated in Figure 2 from the *Ford Counterfactual* (reproduced above), the investment trends observed under Title II are very similar to those under Title I during the period 1980-2009, supporting the proposition that regulatory classification has little impact on investment.

[310] *Ford Counterfactual Update,* p. 2.
[311] *2017 NPRM,* ¶¶45-46.